

**IMPACT OF
NHM ON SOCIO-ECONOMIC DEVELOPMENT OF FARMERS OF
ODISHA**

DHARITRI MEHENA



**DEPARTMENT OF EXTENSION EDUCATION
COLLEGE OF AGRICULTURE
ORISSA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY
BHUBANESWAR-751003
2014**

**MEHENA, D., M.Sc. (Ag.), THESIS-2014 IMPACT OF NHM ON SOCIO-ECONOMIC
DEVELOPMENT OF FARMERS OF ODISHA**

VISIT...

LANZAROTE
Caliente.COM

**IMPACT OF
NHM ON SOCIO-ECONOMIC DEVELOPMENT OF
FARMERS OF ODISHA**

**A THESIS SUBMITTED TO
ORISSA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY, BHUBANESWAR
IN PARTIAL FULFILMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
MASTER OF SCIENCE IN AGRICULTURE
(EXTENSION EDUCATION)**

BY

DHARITRI MEHENA



**DEPARTMENT OF EXTENSION EDUCATION
COLLEGE OF AGRICULTURE
ODISHA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY
BHUBANESWAR, ODISHA-751003**

2014

THESIS ADVISOR:

DR.S.K.ROUT



**DEPARTMENT OF EXTENSION EDUCATION, COLLEGE OF AGRICULTURE
ORISSA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY
BHUBANESWAR-751003, ODISHA**

DR.S.K.ROUT

PROFESSOR EXTENSION EDUCATION

DIRECTOR PME

CERTIFICATE

This is to certify that the research work recorded in this thesis “Impact of NHM on socio-economic Development of Farmers of Odisha” submitted in partial fulfillment of requirements towards award of degree of master of science in Agriculture(Extension Education) to Orissa university of Agriculture and Technology, Bhubaneswar is an authentic record of bonafide research work carried out by Miss Dharitri Mehena under my close guidance and supervision.

The research work is original and no part of it has been submitted for any other degree or diploma or published /sent for publication in any form. The help and information received during the course of investigation has been duly acknowledged by her.

I wish all success in her life.

Bhubaneswar

Dt:

(Dr.S.K.Rout)

**PROFESSOR EXTENSION EDUCATION
DIRECTOR PME**

APPROVAL SHEET

IMPACT OF
NHM ON SOCIO-ECONOMIC DEVELOPMENT OF
FARMERS OF ODISHA

A THESIS SUBMITTED TO
THE ODISHA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY, BHUBANESWAR
IN PARTIAL FULFILMENT OF THE REQUIREMENT
FOR THE DEGREE OF

MASTER OF SCIENCE IN AGRICULTURE
(EXTENSION EDUCATION)
2014

BY

DHARITRI MEHENA

ADVISORY COMMITTEE:

CHAIRMAN : DR.S.K.ROUT
PROFESSOR EXTENSION EDUCATION
DIRECTOR PME

MEMBERS: 1. DR.R.N.DAS
PROFESSOR AND HEAD
DEPARTMENT OF EXTENSION EDUCATION

2. DR. A.K. PARIDA
PROFESSOR AND HEAD
DEPARTMENT OF AGRICULTURAL STATISTICS

EXTERNAL EXAMINER

ACKNOWLEDGEMENT

It is alluringly a jubilating occasion and unique opportunity to express my deepest sense of requital and indebtedness to my venerated guide Dr.S.K.Rout, Director of planning, monitoring and evaluation, OUAT, Bhubaneswar for his enduring interest, sincere guidance, inspiring suggestions and constructive criticism inspite of his multifarious engagements. His paternity and filial love, enduring patience coupled with facetious engagements nature generated in me the impetus that led to completion of my work and to prepare the manuscript smoothly and successfully.

I, further, avail this unique opportunity and privilege to optimize my deepest sense of gratitude and indebtedness to Dr.B.P.Mohapatra, Assistant Professor, Department of Extension Education, OUAT, Bhubaneswar for his valuable advice, ceaseless encouragement and providing necessary suggestions during the research work.

I like to record my profound gratitude to Dr. Amulya Parida, professor and Head, Department of Agricultural Statistics for his valuable suggestions and guidance throughout the preparation of the thesis.

I do extend my special indebtedness and hearty gratitude to my esteemed professors Dr.B.Parasar, Dr. R.N. Das, Dr.B.Mohanty, Dr.S.P. Sangram Singh, Dr.R .K. Raj, Dr. R.S. Panigrahi, and Dr.A.P.Kanoongo, Dr.D.k.Dora for their valuable suggestions, constant inspiration and frequent enquiry about the progress of work.

I must gratefully acknowledge my deep sense of gratitude to the officials of Horticulture office, Dhenkanal & Kamakhyanagar especially to, RA for the selfless co-operation provided during the collection of data.

I also feel a great pleasure to express my profound gratitude to the respondents, but for their co-operation this investigation would not have been possible.

Words feel scanty to extend my thanks to my seniors Sitaratnamala didi for her unflinching support and tireless help during my thesis.

It remains a living memory to recollect the help rendered by my friends Himanshubhai, Rojalin, Bindu, Simi, Phanishree, Anupam, Rukeiya, Poornata, Anil.

I highly appreciate the love, encouragement and the affection of my sister Gayatree for her ever-lasting love and unmatched support for building my career.

At the nib but not neaptide,I bow down my head before my adorable parents, whose blissful blessings, unfathomable love, incessant inspiration have made me so today. Their love,affection and blessings always stand as able company in every walk of my life.

Last but not the least,I solicit the benediction of for the progress and prosperity of my life.

Bhubaneswar

Dated

(Dharitri Mehena)

Name of the Student:	Dharitri Mehena
Admission No:	10EE/12
Title of the thesis:	“Impact of NHM on Socio-economic Development of Farmers of Odisha”.
Degree of which Submitted:	Ms. Sc. (Ag) Extension Education
Name of the Department & College:	Extension Education, College of Agriculture, Orissa University of Agriculture and Technology, Bhubaneswar.
Year of Submission:	2014
Name of the Advisor:	Prof. S.K. Rout, Dept. of Extension Education

ABSTRACT

Study on “Impact of NHM on Socio-economic development of farmers of Odisha” was conducted in 12 villages covering 4 Blocks of Dhenkanal District namely kamakhyanagar, Dhenkanal Sadar, Hindol & Kankadahad 120 responded were chosen for the study from 4 Blocks. The objectives of the study are to study about the socio-economic characteristics of farmers with specific reference to horticulture enterprise, assessment of knowledge and skill development of farmers after availing the benefit of NHM, Assessment of effectiveness of NHM for improvement of socio-economic condition of farmers, study on the constraints faced by the farmers in operation of NHM programme and presentation of some case study in implication of NHM Programme. The identified NHM beneficiaries were interviewed with the help of a structure scheduled. The statistical majors used for analysis and presentation of data were percentage, mean score, rank order, standard deviation and CR value. 70% of benefiting respondent families have better socio- economic development. All the above farm families are coming under joint family system, which justifies that the technology adoption is more in case of joint family system. Respondents have opined that economic benefit, higher production, gathering up to date knowledge and skill enhancement are the key factors for the success of the programme. The constraints observed and opined by the responded are inadequate time period of the project staffs and fear on adverse effect of technology. Further among the constraints the organizational constraints with average mean score 3.30, constraints in planning with average mean score 3.34, constraints in programme implication with average mean score 3.55 and constraints in funding with average mean score 3.87 were assessed through the study. Finding of this study will help the planner and executers during implementation of rural development programme.

CONTENTS

CHAPTER	PARTICULARS	PAGE NO.
I	INTRODUCTION	1-12
II	REVIEW OF LITERATURE	13-23
III	THE SETTINGS	24-36
IV	CONCEPTUAL FRAMEWORK	37-43
V	RESEARCH METHODOLOGY	44-57
VI	RESULT AND DISSCUSSION	58-93
VII	SUMMARY AND CONCLUSION	94-99
	BIBLIOGRAPHY	i-vii
	APPENDICES	i-x

LIST OF TABLE

TABLES	PARTICULARS	PAGE NO.
1.1	Production of planting material of model nursery	5
1.2	Production of planting material of small nursery	6
1.3	cost and assistance of Protected Cultivation	6
3.1	Odisha at a glance	27
3.2	Agro climatic zones of Odisha	28
3.3	Climatic condition of the study area	29
3.4	Details of roads in Dhenkanal	31
3.5	District at a glance	31
3.6	Administrative set up of the study area	32
3.7	Credit-deposit ratio of the district	32
3.8	Land utilization pattern	32
3.9	Agricultural land utilization of the district	34
3.10	Area under different crops of Dhenkanal	35
3.11	Per Hacter productivity of main crops of Dhenkanal	36
5.1	Selection of respondents	47
5.2	Measurement procedure	48
5.3	Scoring of age category of respondents	49
5.4	Scoring of caste category of respondents	49
5.5	Scoring of family type of the respondents	50
5.6	Scoring of family size of the respondents	50
5.7	Scoring of type of house of the respondents	51
5.8	Scoring of education of the respondents	51
5.9	Scoring of size of land holdings of the respondents	51
5.10	Scoring of respondents according to average annual family income	52
5.11	Scoring of cosmopolitaness of the respondents	52
5.12	Scoring of social participation of the respondents	53
5.13	Scoring of social participation of the respondents	53
5.14	Scoring of extension contact of the respondents	53
5.15	Scoring of material possession of the respondents	54
5.16	Scoring of livestock possession of the respondents	54
5.17	scoring of skill of the respondents:	55
5.18	scoring of attitude of the respondents:	55
5.19	scoring of knowledge of respondents:	55
6.1.1	Distribution of age of the respondents	59

6.1.2	Distribution of caste category of the respondents	60
6.1.3	Distribution of family type of the respondents	60
6.1.4	Distribution of family size of the respondents	61
6.1.5	Distribution of house type of the respondents	61
6.1.6	Distribution of educational background of the respondents	62
6.1.7	Distribution of size of holding of the respondents	62
6.1.8	Distribution of average annual family income of the respondents	63
6.1.9	Distribution according to cosmopolitaness	64
6.1.10	Distribution of social participation of the respondents	64
6.1.11	Distribution of extension contacts of the respondents	65
6.1.12	Distribution of material possession by the respondents	66
6.1.13	Distribution of livestock possession of the respondents	66
6.2.1	Knowledge of beneficiaries regarding objectives and activities of NHM	67
6.2.2	Purpose of involvement of the beneficiaries	68
6.2.3	Perceptions of beneficiaries	69
6.2.4	knowledge on nursery preparation	70
6.2.5	knowledge on Plantation of fruit crops	70
6.2.6	knowledge on Post-harvest of fruits and vegetables	71
6.2.7	knowledge on Protected cultivation and green house cultivation	71
6.2.8	Organic farming	72
6.2.9	knowledge on Rearing of honey bee	72
6.2.10	knowledge on Vermicomposting	73
6.2.11	knowledge on Mushroom cultivation	73
6.2.12	knowledge on Integrated nutrient management	74
6.2.13	skill development of beneficiaries	74
6.3.1	Degree of improvement or deterioration of the respondents	76

6.3.2	Comparative study of average annual income	77
6.3.3	Reasons for increased income	77
6.3.4	improvement in socio-economic condition	78
6.3.5	Comparative study of house types	78
6.3.6	Comparative study of Material possession	79
6.3.7	Comparative study of Livestock possession	79
6.3.8	savings by the beneficiaries	80
6.3.9	Technological development of the beneficiaries	81
6.3.10	economic development of the beneficiaries	82
6.3.11	social development of the beneficiaries	83
6.3.12	Environmental factors affects development of the beneficiaries	84
6.3.13	cultural Developments of the beneficiaries	84
6.3.14	Developments of Aspiration of the beneficiaries	85
6.4.1	Organization Constraints faced by Farmers	86
6.4.2	constraints in planning faced by farmers	87
6.4.3	constraints in programme implementation	87
6.4.4	Constrains in funding faced by the beneficiaries	88
6.4.5	Technological Constrains faced by farmers	88
6.4.6	Constrains in monitoring and evaluation faced by farmers	89

LIST OF FIGURE

FIGURES	PARTICULARS	AFTER PAGE
A	Map of Odisha showing adopted districts	24
B	Map of Dhenkanal	26
6.1.1	Distribution of respondents according to their age	59
6.1.2	Distribution of respondents according to their caste	60
6.1.3	Distribution of respondents according to their family type	60
6.1.4	Distribution of respondents according to their family size	61
6.1.5	Distribution of respondents according to house type	61
6.1.6	Distribution of educational background of the respondents	62
6.1.7	Distribution of size of holding of the respondents	62
6.1.8	Distribution of average annual family income of the respondents	63
6.1.9	Distribution according to cosmopolitaness	64
6.1.10	Distribution of social participation of the respondents	64
6.1.11	Distribution of extension contacts of the respondents	65
6.1.12	Distribution of material possession by the respondents	66
6.1.13	Distribution of livestock possession of the respondents	66
6.2.1	Knowledge of beneficiaries regarding objectives and activities of NHM	67
6.2.2	Purpose of involvement of the beneficiaries	67
6.2.3	Perceptions of beneficiaries	69
6.2.13	skill development of beneficiaries	74

6.3.1	Degree of improvement or deterioration of the respondents	76
6.3.2	Comparative study of average annual income	77
6.3.3	Reasons for increased income	77
6.3.4	improvement in socio-economic condition	78
6.3.5	Comparative study of house types	78
6.3.6	Comparative study of Material possession	79
6.3.7	Comparative study of Livestock possession	79
6.3.8	savings by the beneficiaries	80
6.3.9	Technological development of the beneficiaries	80
6.3.10	economic development of the beneficiaries	82
6.3.11	social development of the beneficiaries	82
6.3.12	Environmental factors affects development of the beneficiaries	84
6.3.13	cultural Developments of the beneficiaries	84
6.3.14	Developments of Aspiration of the beneficiaries	85
6.4.1	Organization Constraints faced by Farmers	85
6.4.2	constraints in planning faced by farmers	87
6.4.3	constraints in programme implementation	87
6.4.4	Constrains in funding faced by the beneficiaries	88
6.4.5	Technological Constrains faced by farmers	88
6.4.6	Constrains in monitoring and evaluation faced by farmers	88
6.5.1	Case study figures	93

ABBREVIATION

NHM- National Horticulture Mission

ha- hectare

SC- schedule caste

ST- Schedule tribe

SHG- Self help group

VAWs- Village Agricultural workers

%- percentage

k.m. - kilometre

INTRODUCTION

Agriculture is an important sector of Indian economy as it contributes about 13.7% to the total GDP in 2012-13 and provides employment to over 60% of the population. Indian agriculture has registered impressive growth over last few decades. Now-a-days Horticulture has emerged as an important sector for diversification from agriculture. Horticulture is perhaps the most profitable venture of all farming activities as it provides ample employment opportunities and scope to raise the income & socio-economic condition of the farming community. It also has tremendous potential to push the overall agriculture growth to more than the targeted 4 percent.

The climatic conditions prevailing in India are favourable for a large number of horticulture crops such as fruits, vegetables, roots and tuber crops, ornamental, medicinal and aromatic plants. Production of horticultural crops has witnessed a significant improvement over the years, of the 11 per cent of the total cropped area, horticulture accounts for about 30 percent of agriculture GDP in India. India ranks second in the global production of fruits and vegetables next to China. Its share in the World fruit and vegetable production is about 9.2 per cent and 9.24 per cent respectively. India is the largest producer of mango, banana, sapota and acid lime and has the highest productivity of grapes per unit area in the World. Despite this, India's share in fruits and vegetables trade in the World is very low.

Though the Government has been taken many initiatives to boost horticulture sector in the country. These include National Horticulture Mission (NHM), National Horticulture Board, Technology Mission As warehouses and cold storages etc.

Again 263 million people are working in agriculture in India, over half of all workers. But India is losing 2,000 Farmers Every Single Day due to lower production. In Odisha 85% of the population live in rural area. Cultivators and agricultural labourers constitute 65% of the total workforce. Horticultural crops are grown over an area of 12 lakh hectares having potential up to 20 lakh hectares. The productivity of fruits are quite low (5.93) as compared to national average (10.7) and much more less than world average. The main reason is the prevalence of old and senile orchards, lack of improved planting material of high yielding varieties/hybrids, inadequate post-harvest infrastructure and relative backward ness of the state farmers and tribal groups. The launching of National Horticulture Mission has come as an opportunity for the state to develop concentrated pockets of plantation, rejuvenation of old orchard and creation of post-harvest and marketing infrastructure. National Horticulture Mission (NHM) is an Indian horticulture Scheme promoted by Government of India. It was launched under the 10th five-year plan in the year 2005-06. National Horticulture Mission (NHM) will be implemented in all the States and Union Territories of India except the North Eastern States, Himachal Pradesh, Jammu & Kashmir and Uttaranchal (for which a separate Technology Mission for integrated development of horticulture exists) to promote holistic growth of the horticulture sector covering fruits, vegetables, root & tuber crops, mushroom, spices, flowers, aromatic plants, cashew and cocoa. This will be a centrally sponsored scheme in which Government of India shall provide 100% assistance to the State Missions during Tenth Plan. During the XI Plan, the Government of India assistance will be 85% with 15% contribution by the State Governments.

In Odisha the scheme is being implemented in 24 identified potential districts with cluster approach. District covered under NHM include Mayurbhanj, Keonjhar,

Balasore, Cuttack, Khurda, Puri, Nayagarh, Naupara, Bolangir, Kalahandi, Sonepur, Gajapati, Rayagada, Koraput, Malkangiri, Navrangpur, Dhenkanal, Ganjam, Phulbani, Angul, Bargarh, Deogarh, Sambhalpur and Sundargarh.

The focus crops identified under the programme include Mango, Citrus, Litchi, Banana, Cashew, Betel vine, Ginger, Turmeric, Flowers and Medicinal Plants & Aromatic Plants.

The main objectives of the Mission are:

- To provide holistic growth of the horticulture sector through an area based regionally differentiated strategies which include research, technology promotion, extension, post-harvest management, processing and marketing, in consonance with comparative advantage of each State/region and its diverse agro-climatic feature;
- To enhance horticulture production, improve nutritional security and income support to farm households;
- To establish convergence and synergy among multiple on-going and planned programmes for horticulture development;
- To promote, develop and disseminate technologies, through a seamless blend of traditional wisdom and modern scientific knowledge;
- To create opportunities for employment generation for skilled and unskilled persons, especially unemployed youth;

To achieve the above objectives, the mission would adopt the following strategies

- Ensure an end-to-end holistic approach covering production, post-harvest management, processing and marketing to assure appropriate returns to growers/producers;

- Promote R&D technologies for production, post-harvest management and processing;
- Enhance acreage, coverage, and productivity through:
 - Diversification, from traditional crops to plantations, orchards, vineyards, flower and vegetable gardens;
 - Extension of appropriate technology to the farmers for high-tech horticulture cultivation and precision farming.
- Assist setting up post-harvest facilities such as pack house, ripening chamber, cold storages, Controlled Atmosphere (CA) storages etc, processing units for value addition and marketing infrastructure;
- Adopt a coordinated approach and promotion of partnership, convergence and synergy among R&D, processing and marketing agencies in public as well as private sectors, at the National, Regional, State and sub-State levels;
- Where appropriate and feasible, promote National Dairy Development Board (NDDB) model of cooperatives to ensure support and adequate returns to farmers;
- Promote capacity-building and Human Resource Development at all levels.

Different components under NHM:-

Production and distribution of good quality seeds and planting material is an important component of the Mission. To meet the requirement of planting material for bringing additional areas under improved varieties of horticultural crops and for rejuvenation programme for old/senile plantations, assistance would be provided for setting up new nurseries under the Public as well as Private sector.

1. Model Nurseries

Infrastructure for model nurseries would include the following:

- Mother stock block maintenance under polycover with a maximum area of 500m² to protect from adverse weather conditions
- Raising root stock seedlings under net house conditions
- Propagation house a maximum of 500m² tropical polyhouse with ventilation having insect proof netting in the sides and fogging and sprinkler irrigation systems.
- Hardening/maintenance in insect proof net house maximum of 2000m² with 35% light screening properties and sprinkler irrigation systems.
- Pump house to provide sufficient irrigation with peak load of 5mm per day and water storage tank to meet at least 2 days requirement.
- Soil sterilization -steam sterilization system with boilers.

Table 1.1(Production of planting material of model nursery):

	Production of planting material		
	a) Public sector		
	Model nursery (4 ha)	Rs. 18.00 lakh/unit	Maximum of Rs. 18.00 lakh per nursery
	b) Private sector		Credit linked back ended subsidy
	Model nursery (4 ha)	Rs. 18.00 lakh/unit	50% of cost limited to Rs. 9 lakh/nursery

2. Small Nurseries

- Small nurseries, covering area of about one ha, will have infrastructure facilities to hold 60,000 to 80,000 plants.
- These plants will be maintained for a period of approximately 9 months.

- Infrastructure for the small nurseries will consist of a net house of 2000m², to screen 35% light.

Table 1.2(Small Nurseries)

1	Production of planting material		
	a) Public sector		
	Small Nursery (1 ha.)	Rs. 3.00 lakh per unit	Maximum of Rs. 3.00 lakh per nursery
	b) Private sector		Credit linked back ended subsidy
	Small Nursery (1 ha.)	Rs. 3.00 lakh per unit	50% of cost limited to Rs. 1.5 lakh/nursery

3.Rejuvenation / Replacement of senile plantations:-

- Low productivity of perennial fruits, like mango, citrus, apple and the plantation crops, like coconut and cashew nut is, primarily, due to small size of holdings, preponderance of old and senile trees and poor management of inputs such as water, nutrients and pesticides.
- To take up productivity improvement programmes through removal of senile plantations, re-plantation with fresh stock supported with appropriate and integrated combination of inputs, pruning and grafting techniques.
- The assistance for rejuvenating senile plantations will be @ 50% of the cost subject to a maximum ceiling of Rs.15,000/- per hacter limited to 2 ha per beneficiary.

- **4.Protected Cultivation**

Activities like greenhouse construction, mulching, shade net and plastic tunnels would be promoted, the assistance for which is indicated below:

Table 1.3(cost and assistance of Protected Cultivation)

1.	Green House (Hi-tech)	Estimated Cost	Pattern of Assistance
	a. Small & Marginal Farmers	Rs. 650/ Sq. m. for hi-tech GH Rs. 250/- Sq. m. for normal GH	50% of the cost subject to a maximum of Rs.325/Sq.m for hi-tech and Rs.125/Sq.m for normal GH, limited to1000 Sq.m./beneficiary
	b. Other farmers	Rs. 650/ Sq. m. for hi-tech GH Rs. 250/- Sq. m. for normal GH	33.3% of cost subject to a maximum of Rs.215/sq.m for hi-tech and Rs.67/Sq.m for normal GH limited to 1000 Sq.m.
2.	Mulching	Rs. 14,000/ha	50% of the total cost subject to a maximum of Rs. 7000/ha limited to 2 ha per beneficiary
3.	Shade Net	Rs. 14 / Sq. m.	50% of cost subject to a maximum of Rs. 3500/ 500 Sq.m limited to 2 ha per beneficiary
4.	Plastic Tunnel	Rs. 10 / Sq. m.	50% of cost subject to a maximum of Rs.5000/1000 Sq.m limited to 5 ha per beneficiary

6. Organic Farming

An organic production system would be designed to:

- Enhance biological diversity within the system;
- Increase soil biological activity;
- Maintain long-term soil fertility;
- Recycle plant and animal waste;
- Rely on renewable resources in locally organized system;
- Promote healthy use of soil, water and air and minimize all forms of pollution;
- Handle agricultural products with emphasis on careful processing methods in order to maintain organic integrity and vital qualities of the product at all stages.

7. Technology Dissemination through demonstrations/ Front line demonstration

- Crop specific cultivation, use of IPM/INM, protected cultivation, organic farming through farmer participatory demonstration in a compact area of one hecter.
- This will be organized at strategic locations in farmer's field for which assistance will be limited to 75% of the cost.
- For green house cultivation, the area will be limited to 500 Sq. m. Farms in the public sector, SAUs could be sites for front line demonstrations, for which 100% assistance will be provided.

8. Post-Harvest Management

- Post-harvest management includes packaging, grading, transportation, curing and ripening and storage.
- Post-harvest is increasing the marketability of the horticulture produce, adding value to the produce, increasing profitability and reducing losses.
- Establishment of pack houses, ripening chambers, cold storage units, Controlled Atmosphere (CA) Storage, supply of refer vans and mobile processing units besides support for market intelligence under NHM.
- All these projects for which the Central Government assistance will be credit linked back-ended subsidy @ 25% of the total project cost in general areas and 33.33% in case of Hilly& Tribal Areas.

9. Bee Keeping:-

- Introduction of scientific apiculture with *Apis cerena indica*.
- Each beneficiaries receives 20 hives.
- Educating the farmers on seasonal management of honey bee for enhancing honey and other hive products.

- Establishment of bee nursery.
- Creating awareness among the farmers about the importance of bee keeping for enhancing crop production.

10. Promotion of Integrated Nutrient Management/Integrated Pest Management

Table 1.4(Promotion of Integrated Nutrient Management/Integrated Pest Management)

Promotion of INM/IPM	Estimated Cost	Pattern of Assistance
i. Sanitary and Phytosanitary (Public Sector)	Project based	Project based
ii. Promotion of IPM	Rs. 2000/ha	50 % of cost subject to a maximum of Rs 1000/ha limited to 4 ha./ beneficiary
iii. Disease fore casting units (PSUs)	Rs.4 lakhs/unit	Upto Rs. 4 lakh/unit

Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis of NHM in Odisha

Strengths

- Ten agro-climatic zones of the State are quite diverse and suitable for growing different types of fruits, vegetables, spices and flowers.
- The high land and medium lands are abundantly available which can be diverted to horticultural crops
- State has got agencies like Orissa State Seeds Corporation, Agriculture Promotion and Investment Corporation Ltd., Orissa State Agricultural Marketing Board to support the Horticultural programmes .
- Access to metropolises like Kolkata, Chennai, Mumbai and Delhi etc. and other big cities enhances the possibilities for export to other States.

- Good co-ordination and linkage with the State Agriculture University.
- Enactment of Fruit Nursery Act-1999 ensures control over producing QPM in the Private Sector.

Weaknesses

- Non-availability of adequate quality planting material.
- Inadequate staff strength and weak extension network in the Horticulture Directorate.
- Existence of large number of old and senile fruit orchards most of which have lost even the capacity to rejuvenate.
- Poor marketing linkage and poor market infrastructure.
- Lesser irrigation facility.
- Incidence of pest and diseases many a times becomes unmanageable.
- Absence of Air connection to major cities other than the metros.
- Poor post-harvest management infrastructure.
- Aspect of updating knowledge and skill of staff regarding recent advancements in the field of horticulture is highly neglected.
- Poor economic condition of the farmers.

Opportunities:-

- There is tremendous demand for fruits, vegetables and flowers in the State which Otherwise is being met by import from other States.
- There is scope for introduction and expansion of new crops and varieties.
- Tremendous scope for establishment of processing units.
- Availability of abundant suitable land for growing horticultural crops.
- Scope for protected cultivation of flowers, vegetables and also planting materials.

- Scope for enhancing the availability of fruits and vegetables to the people for consumption as per national recommendations.
- Scope to generate marketable surplus and also surplus for export.

Threats

- Uncertainty in weather conditions and frequent occurrence of natural calamities like flood, cyclone and drought.
- Uncertainty about market stability and farmers do not get remunerative price.
- Exploitation by middlemen in the market chain.
- High incidence of pest and diseases.

Dhenkanal district is selected purposefully for the study as socio-economic condition of the beneficiaries under NHM of the district is very wretched. Though the district has rich socio-cultural background but the economic status is not sound. Due to illiteracy of people most of the Govt., non-Govt. policies cannot reach the grass root.

Objectives of the study:

- To study about the socioeconomic characteristics of farmers with specific reference to horticulture enterprise.
- To assess the knowledge and skill development of farmers after availing the benefits of NHM.
- To assess the effectiveness of NHM programme for improvement of socioeconomic condition of farmers.
- To study about the constraints faced by the farmers in operation of NHM programme.
- To present some case study on implication of NHM programme

Scope of the study:

The present study quietly analyses the socio-economic characteristics of beneficiaries under NHM and its impact upon the beneficiaries.

The investigation envisages an in depth study to discover various constraints and short-comings associated with the beneficiaries as well as implementing agency personnel of NHM.

This in depth study of the socio-economic impact and constraints might be of some help in planning and executing of Horticulture programmes in future for the planners, administrations, executors and field personnel engaged in the task.

Limitation of the study:

- Due to shortage of time and resources, rigorous and expanded study could not be undertaken with more number of respondents.
- The respondents were mostly ruralized and having low educational background. So it became difficult to collect the accurate information.
- Most of the respondents tried not to disclose their personal factors with reference to their income and land holding.
- Some respondents did not furnish the information as required by the investigator with the motive that the person requiring the information was no way helpful in respect of loan, subsidy or Government grant.
- The administrators and extension functionaries were very much busy in their work. So, all of them could not afford much time in order to give free and frank response.

Review of literature

Past studies pave the ways for the future research endeavor. Need of the review of literature cannot be undervalued in any scientific investigation. Keeping this in mind an attempt is made in this chapter to present a brief review of available studies. Its main function is not only to present the work done in the past but to select the problem area of the present and to reflect and project its utility to the future also. Apart from this other functions can be described below:

- To provide an insight into the methods and procedures of various investigations.
- To provide a sound basis for the purpose of comparison and interpretation of the final result.
- To formulate a basis of the development of theoretical frame work and to know the area in which research work is needed.

An attempt has been made to review relevant literature on different aspects of the investigation which is having direct and indirect bearing on the study and has been under the following headings in this chapter.

1. socio-economic characteristic of beneficiaries under NHM
2. Knowledge and skill development of farmers after availing NHM
3. Effectiveness of NHM in improving socioeconomic condition of farmers
4. Constraints faced by the beneficiaries during the implantation of NHM

Objective-1: To study the socio-economic characteristics of beneficiaries of NHM project.

Age:

Raghunandan (2004) in his study “a study on knowledge and adoption level of soil and water conservation practices by Farmers in northern Karnataka” reported that 45% of respondents (45.33%) belonged to the middle age group, followed by old age (36.25%) and young age group (18.75%) respectively.

Ayoola *et al* (2011) reported in their study “Socio-economic factors influencing rice production among male and female farmers in Northern Guinea Savanna Nigeria: lessons for promoting gender equity in action research.” Reported that age would influence rice production negatively, implying that the older the rice farmers the less the vigour for farming.

Ayoade *et al.* (2011) reported in their study “Impact of national special programme for food security on poverty alleviation among women in Oyo State, Nigeria.” that 39.8% of the women participants are middle aged and still active in agricultural production to reduce agricultural poverty level.

Caste:

Jha and Shakwat (1972) Subramaniam and Kakshmana (1973) Apparao and Menon (1975) found no significant relationship between caste and adoption at improved farmpractices.

Education:

Patil (2000) observed that 36.67% banana growers were educated upto middle school followed by 25% of the banana grower were educated up to high school, while only 5.83% banana growers were illiterate.

Adejo *et al.* (2011) reported in their study that farmers’ inability to buy inputs and poor educational status of farmers has resulted in low adoption of technologies. This problem is further worsened by their lack of access to factor of production which include land, labour and credits.

Binkadakatti *et al.* (2011) observed that 30% of the trained and 36.25% of untrained respondents were educated upto middle school.

Hiary (2014) reported in his topic “Characterization of the Socioeconomic Conditions, Full Package, and Adoption of New Technologies of Wheat Crop at Irbid Governorate, Jordan” that 48% of farmers have finished high school, and 34% have higher education.

Size of land holding:

Patil (2000) found that majority of the banana growers (64.17%) were having medium land holding.

Madhavareddy (2001) in the study on people’s participation in watershed development programme implemented by NGO indicated that 35% of the respondents were marginal farmers, 27% were small farmers and 22% were medium farmers.

Ningareddy (2006) in the study of knowledge extent of participation and benefit derived by participants of the watershed development programme report that comparatively more number of farmers i.e. 64% belonged to semi medium land holding categories followed by 22% in medium categories where as 10.64% had small land holding and 3.33% belonged to big land holding categories.

Shiv kumar (2009) in his report on “Impact Assessment of agriculture intervention in tribal areas” stated that average land holding size for tribal farmer is 2.5 acre. Overall three fifth of the households i.e. 37.6% and 26.3% are small and marginal farmers respectively. He also reported that tribal area having 28.1% literate among men and 49.3% illiterate among women. Only about half of men and one fourth of women in tribal areas have gone outside. 0.59% among women are graduates.

Annual income:

Anchule (2000) reported that majority of farmers 60% belongs to medium income group, 24.40% belongs to low income group and only 15.60% farmers were belonged to high income group.

Muhammad (2010) reported that the contribution of the farm livelihood sources towards income of the households after the diversification of income was 30.60% and non-farm income was 69.40%.

Cosmopolitaness:

Anitha (2004) indicated that more than one fourth (28.30%) of farm women had high cosmopolitans followed by medium (44.20%) and low (27.55%) cosmopoliteness.

Suresh (2004) reported that 45% of the respondents had low level of cosmopoliteness followed by medium level (44.17%) of cosmopoliteness and 10.83% had high level cosmopoliteness.

Sashidhar (2004) conducted a study on influencing factors and constraints in drip irrigation by horticulture farmers of Bijapur district of Karnataka and found that 41.50% of the farmers visited town occasionally followed by once on 15 days (37.50%) whereas respondents visiting to town for the personal or domestic purpose were 54.10% followed by 35% for new technology or agriculture purpose.

Social partnership:

Puthirapathap *et al* (1999) found that a majority members of credit management group belonged to low category of mass media expose.

Kanavi (2000) reported that none of the respondents participated regularly in training and demonstrations. Nearly one third (31.33%) of respondents participated in Krishimela, whereas very less no. of respondents participated in extension activities like farm visits (1.33%) group discussion (2.66%) and study tour (4.00%), where as 20% participated occasionally in Krishimela followed by training (4.66%) group discussion (4.00%) demonstration and farm visit (2.00%) and study tour (0.66%).

Nagaraja (2007) found that (79.91%) of the respondents were not participating in any of the extension activities whereas 8.33% of the respondents were found participating in field days followed by training (5.41%), Krishimela (4.99%) and extension tours (3.35%) as observed.

Olajide (2011) indicated that farmers are collecting information from (76.3%) Fellow farmers, (63.3%) extension agents, (49.2%) friends, and from (48.3%) radio through participation.

Kgosiemang *et al.* (2012) reported in his studies that 67.3% farmers are receiving information from radio and 58.7 % farmers are willing to participate in agricultural projects.

Objective-2: To assess the knowledge and skill development of farmers after availing the benefits of NHM

Singh(1990) reported that there was a significant change in skill level of kvk beneficiaries with respect to technology adoption.

Mohapatra *et al.*(1991) revealed that the skill level of farmers in puri district with respect to line sowing, spacing, seed treatment and application of fertilizer were partially developed but up to the recommended technology.

Hugar (1992) concluded that skill level of farmers in enterprise adoption increases with involvement in extension activities.

Raghuwanshi and jawlkar (1992) revealed that there was 73 percent and 63 percent skill adoption with respect to fertilizer application and plant protection.

Nayak (1995) reported that the extent of adoption in knowledge and skill in agro-forestry programme were medium level by the farmers.

Dimple *et al.* (1996) found out that KVK trained 32 percent farmers adopted skill/knowledge in poultry and 35 percent the dairy technology.

ChaitanyaKumari (1998) reported as information seeking behaviour has the influence on extent of knowledge , hence it is advisable that ITDA authorities need to widen the mass media exposure and extension personnel contact to isolated tribal people by supplying community radios, TV sets and by strengthening the extension contacts.

Chaitanya kumara (1998) reported that the opinion of the beneficiaries can be improved by making aware about the programmes and its objectives and of the same time supporting individual and marketing facilities.

Mishra (2002) reported that the knowledge and skill of rice growers was at medium level.

Gogoi *et al.* (2000) reported that the level of knowledge of the trained farmers on recommended practices of rice was significantly higher than non-trained farmers.

Nagabhusan (2001) observed that the watershed area and their preparation have greater emphasis to sustain the agricultural development in watershed area.

Purusottam and Singh (2001) observed that overall awareness programme had very low and the beneficiaries only aware to the activities in an unorganized way in implementation of NWDP for Rainfed Agriculture.

Ahire and Lambat (2002) found that the beneficiaries of Umari watershed development project had followed improved practices like proper sowing time, spacing, fertilizer application and on-farm water management to the highest extent which enabled them to harvest more yield as compared to non-beneficiaries.

Arora (2003) suggested that for better implementation of watershed development programmes, exposure to technology, need based training, effective linkage and co-ordination with local institutions , minimization of information gap and regular quarterly review meeting by the implementation staff as well as steering committee are essentially required which could be considered on priority basis.

Hanumanthaiah and Pokuri (2003) stated that watershed programme had opened new wishes by exploiting and considering the scarce resources i.e. brought major changes in the cropping pattern , generating employment opportunity to the marginal and small farmers enabling to raise their incomes as well as standard of living.

Raghunandan (2004) reported that about 17.50% of respondents had complete knowledge of contour cultivation purpose. Majority of respondents possessed the knowledge of reduces soil erosion and conserves soil moisture (62.50%) followed by reduced cost of cultivation (50%) directly improves soil fertility (26.25%).

Singh (2004) experiment was conducted in Haryana about knowledge level at about adoption of technology. Results revealed that overall knowledge level of women was 53.52% socio physiological trait has significant and positively related to their knowledge level.

Nanda (2004) It was found that 64.08% of respondents in developing villages had a high adoption rate and 86% respondents in under development villages had nil adoption rate.

Yadav *et al.*(2006) indicated that the soil testing process was well known to the farmers and they also knew its importance. But the attitude of farmers towards soil testing practices was unfavourable. The efforts should be made by KVK and

department of Agriculture to encourage the farmers in adoption of soil testing practices by organizing training programmes.

Mourya (2006) found that the farmers in watershed area have comparatively more knowledge and adoption than in non-watershed so far the scientific wheat production technology is concerned.

Akhilesh kumar Dubey *et al.* (2007) inferred that the on-campus trainees have more favourable attitude than the off-campus trainees. This is indicating that the exposure of KVK training programme significantly changed the attitude of farmers in desired direction which one could obviously expect.

Akhilesh kumar Dubey and J.P. Srivastava (2007) found that trainees had high level of knowledge (100%) where as in case of non-trainees, 52% high level, 44% medium level and only 4% with low level of knowledge. There was a significant difference between trainees and non-trainees regarding the knowledge about the package of practices of wheat crop. The study also revealed that most of the trainees (84%) had higher level of adoption followed by medium level (16%) whereas most of the non trainees had medium level of adoption (64%) followed by low level of adoption (32%).

Thoreet *al.* (2009). observed that out of ten independent variable, education, land holding, annual income, social participation, extension contact, sources of information and risk bearing ability had positive and significant relationship with knowledge, while age has negative and significant relationship with knowledge. From multiple regression analysis it came to know that education, risk bearing ability and social participation had highly significant and positive effect on the knowledge.

Munir Hussain Naik *et al.* (2009) indicated that nearly half of farmers had high knowledge, very few of them had low knowledge and remaining had medium level of knowledge about organic farming practices.

Karamjit Sharma *et al.* (2009) revealed that majority of the respondents of all the categories possessed moderate knowledge about buffalo husbandry management practices ranging from 55.60% followed by poor and high knowledge.

Mishra *et al.* (2009) revealed that an average of rs.100900 was recorded net profit under recommended practice while it was rs.87430 under farmers practice. Cost

benefit ratio was 2. 62 - 3. 63 under demonstration while it was 2. 35 - 3. 13 under control plots. By conducting front line demonstration of proven technologies, yield potential and net income from potato cultivation can be enhanced to a great extent with increase in the income level of the farming community.

Dan Singh *et al.* (2011) found that the KVK trained trainees had high level of perceived characteristics about wheat, paddy and sugarcane crop production technology and medium level of perceived characteristics about oil seeds and pulses crop production technology.

Sanjeev kumar *et al.* (2011) reported that the knowledge index of different aspect of scientific dairy farming practices of breeding, feeding, health care and management were 42, 37. 84, 39. 75 and 41. 73% respectively and overall knowledge index of improved dairy farming practices were 39. 63 which indicates poor knowledge level of dairy farmers in the study area.

Binkatti *et al.* (2011) reported that 38.75% of trained and only 17.50% of untrained farmers belonged to high category in overall knowledge level.

Objective-3: To assess the effectiveness of NHM for improvement of socio-economic condition of farmers.

Pattnaik (1999) in his study “Role of NGOs in Rural Development” found that the adoption of HYV seeds, pesticides, water pump, tractor, bullock, mushroom culture, bee keeping, poultry farming, dairy, fishery etc. are on an appreciable extent due to the continuous education persuasion and advise of the NGOs and also there was significant change over socio-economic condition of the people by the NGO adopted areas.

Dash (2001) in his study “ Role of NGOs in agricultural development “stated there is significant increase with regard to whole hearted effort by the members .There was significant increase in yield in case of rice within seven years followed by pulses and vegetables.

Satyanarayan (2002) in his study “An evaluation of watershed programme in Tumkur District” reported that majority of the beneficiaries received higher income and all of them were employed after development of the programme.

Parhi (2002) in his study concluded that adoption of technology like keeping poultry , exotic breeds and bee keeping were found to be quite significant by the farmers . The adoption of poultry farming practices has increased to 377.60% by rural farmers. Further he mentioned that due to higher adoption of better technologies the socio-economic condition of the people has been influenced to a greater extent.

Lagun (2002) intimated that there is a significant change in the socio-economic conditions of the species farmers on various aspects like literacy, house structure, annual income, material possession. A drastic reduction in number of persons going outside as labourers was also reported.

Nirmala (2003) in her study on impact of watershed development programme on socio-economic dimensions of beneficiaries revealed that the household income generated from the watershed area i.e. Rs. 30655.56/- was found to be relatively higher than that of non-watershed area i.e. Rs23171.47/- .There was an increase of 32.29%.

Banger and Sthool (2004) in their study in Arigale village of Maharastra stated that participation of watershed people in pomegranate plantation growth improved the standard of living and income of villagers.

Patil (2009) in his research concluded that BAIFn working in Maharastra was successful in improving the livelihoods of the small scale farmers and tribal communities in the state. It also resulted in gaining self-employment at the doorstep of farmers, it has also enhanced household income in case of tribal families.

Eswarappa (2009) in his study revealed that due to the interventions of NGOs there is some change in the life of “Sugalis”. In terms of quantity a number of households have crossed the below poverty line due to efforts by NGOs.

Lanjewar (2011) studied that majority of the respondent beneficiaries were received benefits from fruit crop plantation scheme, followed by flower cultivation, rejuvenation of old orchards, spice crop cultivation, organic farming, shed net, vermicompost unit, vegetable development programme and pack house scheme

Barua *et al* (2012) Extent of adoption of technology by rural youth trained in KVK of AAU, in Assam, majority of the trained rural youth respondents (53.75%) has medium level of extent of adoption on selected technology practices, while 26.25% and 20%

of the trained rural youth respondents had high and low level of extent of adoption on selected technology practices respectively.

Choudhary (2013) studied that Horticulture is perhaps the most profitable venture of all farming activities as it provides ample employment opportunities and scope to raise the income of the farming community.

Tushar Panigrahi (2013) Extent of adoption of the recommended sweet pepper production technology by the sweet pepper producers revealed that 42% had complete adoption while 58% partial adoption on recommended package of practices.

Jaganath Barik (2013) around 93.33 percent farmer have problem of getting on availability of quality seed at planting time. Similarly 90 percent farmers faced problem of high cost of good quality seed. Around 71.66 percent farmers feel that high incidence of insect pest and diseases are a very serious problem. Lack of irrigation facility was a problem faced by 76.67 percent farmers. Also 85 percent farmers feels that very limited supply of good quality seed by government will results in the less production. High cost of fertilizers and plant protection chemicals was faced by 91.6 percent farmers and non-availability of fertilizers and pesticides at planting time are the production constraints faced by 26.66 percent farmers while growing the vegetable cultivation.

Kassem (2014) studied that All Methods group had acquired the maximum knowledge and skills with the percentages of 55.8%, 48.3% respectively followed by the Demonstration method, the Meeting method and the Pamphlet method.

Objective-5: To study about the constraints faced by the farmers in operation of NHM programme.

Constraints:-

Gupta and Rathore (1998) the marginal farmers sold their whole qualities of chillies through producer-consumer channel. Lack of vegetable based processing industry, regulated and co-operative marketing, grading facilities, quick and effective means of transportation and inadequate system to disseminate the market information are major constraints in chilly marketing.

Moore and Stewart (1998) stated about the structural growth problem, once they are successful they face the problem of replacing one person management with a more institutionalized structure. The founder is used to have total control and do things in his or her own way. It is difficult to persuade him / her to create independent management or expert roles or to respect the authority and autonomy of independent managers and experts once they are in place. Their styles, ethics and values are often severely challenged by the formality and the bureaucratic discipline that is imposed by variety of external funding from public organization.

Reddy and Purushottam (2002) stated that lack of access to technologies and access to credit apart from illiteracy are some of the major constraints experienced by poor in their struggle to come out of poverty.

Patel (2009) conducted a study on working of NGOs in the tribal areas of Dahood, Gujarat. He found out that traditional cultivation methods, lack of extension services, old beliefs, erratic rainfall, marginal and undulating topography are cumulating factors for low adoption of technology in tribal areas.

Sagar (2001) observed problems of large mushroom grower as lack of good quality of spawn, uncertainty in price of mushroom, lack of common facility for storage of fresh mushroom, problems pertaining to small and marginal mushroom growers and non-availability of requisite inputs, complex process of obtaining loan, finance, lack of low cost mushroom farm design and lack of training facilities.

Lagun (2002) found that “provision of credit facilities through commercial banks and co-operative societies.” lack of co-ordination and co-operation among various development departments and non-responsive nature of the extension functionaries are major constraints in cultivation of spices.

Tripathy (2009) found that the top most constraint was lack of vehicle facility, irregular maintenance of office records and lack of administrative control.

Godara *et al.* (2009) observed that the difficulty in getting funds in time, step motherly treatment to extension scientists and the adulterated inputs, influenced adversely the credibility of the extension scientist and also lack of convey and motivation and incentives for extension work and limited financial allocation for extension activities were major constraints affecting the productivity of extension scientists.

THE SETTING

Orissa is the 10th largest State in area and 11th in population in the country, accounting for 5% of the geographical area and 4% of the population of the country. State has a geographical area of 1.56 lakh sq. km and population of 3.68 crore as per 2001 census. Administratively the State is divided into 30 districts, 58 subdivisions, 314 CD blocks, 171 tehasils, 35 municipalities and corporations, 6234 gram panchayat and 11349 villages. Out of the total population, Scheduled Caste and Scheduled Tribe constitute 17% and 22% of the total population respectively. 85% of the population lives in rural area. Cultivators and agricultural labourers constitute 65% of the total workforce. The total literacy percentage is 63.08. The State is located in the eastern region of the country and spreads 450 kms along the Bay of Bengal.

Climate:-

The climate of the State is tropical, characterized by high temperature, high humidity, medium to high rainfall and a mild winter. The normal rainfall is 1482.2 mm distributed over 72 rainy days. South West monsoon contributes about 81-83% of the annual rainfall in 53-57 days during June-September. The mean annual temperature of the State is 26.890 C with mean annual maximum of 32.560 C and mean annual minimum of 21.300 C.

Soil:-

From the physic-graphic point of view, the State consists of four Zones, viz. (i) Northern Plateau (ii) Eastern Ghat Zone (iii) Central Table lands, and (iv) Coastal plain zone. However, on the basis of climate, soil, rainfall, topography and crops suitability, the State has been divided into ten Agro-Climatic zones. The soil types differ widely from highly acidic to slightly alkaline and from light sandy to stiff clays. The soils are mainly acidic with the degree of acidity varying widely. Further, about 4 lakhs ha, are exposed to saline inundation, 3.54 lakh hacter. to flooding and 0.75 lakh hacter to water logging particularly in the deltaic areas.

Land Availability:

The State has a total cultivable area of 61.65 lakh hectares. Out of this, 15.57 lakh hectares are low lands, 19.14 lakh hectares are medium lands and 26.94 lakh hectares are high lands. In Orissa generally agricultural crops particularly Paddy are grown in

the Low & Medium land area is a consolidated manner. So there is vast scope to convert the Up lands and waste lands of the State for Horticultural crops. It was envisaged during the preparatory phase of NHM to cover at least 7.0 lakh ha. Lands, out of which, they have achieved only 2.5 lakh ha. under NHM other schemes during last 5 year. Hence, there is immense scope for crop diversion particularly to horticultural crops. Thus 4.5 lakh hectares area can be safely covered under horticultural crops in coming years.

Irrigation:-

Out of total cultivable area, about 41% is under irrigated condition (Kharif 18.5 lakh ha + Rabi 8.5 lakh ha). and 59% is non –irrigated. The total irrigation potential created so far from all sources is about 39.31 lakh ha. (Kharif 25.65 lakh ha. & Rabi 12.66 lakh ha.). The gross irrigated cropped area is 27 lakh ha. which is about 68% of the potential created.

Farming structure:-

According to the agricultural census, there were 40.66 lakh operational farm holdings occupying 50.81 lakh ha with an average land holding of 1.25 ha the marginal and small farmers constitute 85% of the farmers who have access about 50% of the operational area. Thus the remaining 50% is occupied by only 15% of landholders.

Orissa produces about 10.51 m. MT of horticultural produce from an area of 1.30 m ha and accounts for 4.89% of total horticultural production in the country. The vegetables (80.59%) and fruits (14.59%) form the major horticultural produce in the State.

1. Mango

- Orissa produces about 0.45 m MT of mango from an area of 0.16 m. ha. With productivity of 2.7 t/ha and accounts for 3.53% of total production of mango in the country.
- The major mango producing belts in the State are Dhankanal, Ganjam, Koraput and Puri.

2. Citrus

- The State is the third major lemon producing State in the country.
- Orissa accounts for 9% of total production of lemon in the country. The State produces 0.22 m. MT of citrus from 0.03 m. ha. with productivity of 8.2 t/ha.

3. Banana

- State produces about 0.33 m. MT of banana from an area of 0.02 m. ha. with the productivity of 13.57 t/ha and forms 23.30% of total production of fruit crops in the State.

4. Sweet Potato

- Orissa is ranked first in production of sweet potato accounting for 37.2% of total production of sweet potato in the country.
- State is producing about 0.4 m MT of sweet potato from an area of 0.05 m ha. having productivity of 8.5 MT/ha.
- The recommended varieties of sweet potato in the State are Bubansankar and Gouri.

5. Okra

- Orissa is the third major Okra producing State in the country and accounts for 14.1% of total production of okra. The State produces about 0.64 m. MT of okra from an area of 0.07 m. ha. with the productivity of 8.7 t/ha.

6. Cabbage

- Orissa is the second major cabbage producing State in the country and accounts for 14.1% of total production of cabbage.
- The State produces about 0.97 m MT of cabbage from an area of 0.03 m ha with productivity of 27.8 t/ha.
- The major cabbage producing belts in the State are Balasore, Bolangir, Cuttack, Dhankananil, Ganjam, Keonjhar and Koraput.

7. Cauliflower

- Orissa is the third most cauliflower producing State in the country and accounts for 10.2% of total production of cauliflower. The State produces about 0.66 m MT of cauliflower from an area of 0.05 m ha, with the productivity of 14.4 t/ha.

8. Tomato

- Orissa is the third largest producer of tomato in the country. The State produces about 1.36 m. MT of tomato from an area of 0.10 m ha. with the productivity of 13.5 t/ha.

9. Brinjal

- Orissa is the second largest producer of brinjal accounting for 18.9% of total production of brinjal in the country.
- The State produces 1.97 m. MT of brinjal from an area of 0.13 m ha. With productivity of 15 t/ha.

ABOUT DHENKANAL DISTRICT:-

Dhenkanal is one of the adopted village of National Agricultural Innovation Project. The study was carried out in four adopted villages of Dhenkanal district namely Khalibandha, Nuagaon, Gunadei and Belapada. So, here some demographic, agricultural and allied sector details of Odisha with Dhenkanal and its adopted villages has been presented. The state Odisha lies in between 17°31' to 22°27'N latitude and 81°27'to 87°30'E longitude. It is bounded by West Bengal in North-East, Jharkhand in North, Chhattisgarh in West, Andhra Pradesh in South and Bay of Bengal in East. The state consists of 30 districts, 476 sub-divisions, 223 towns, 51,313 no. of villages. 16.68% of population belongs to urban area. The total number of literates is 77,84,54,120. The male literacy number is 44,42,03,762. The female literacy number is 33,42,50,358. The distinctive features of the state are as follows.

Table 3.1 Odisha at a glance:-2011 census

SI No.	Parameters	Unit	Magnitude
1	Geographical Area	Km ²	4,55,707
2	Population	Number	4,19,74,218
3	Male Population	Number	2,12,12,136
4	Female population	Number	2,07,62,082
5	Literacy rate	Percentage	73.45
6	Male literacy rate	Percentage	82.40
7	Female literacy rate	Percentage	64.36
8	Sex Ratio	Female per 1000 male	979
9	Child sex ratio	Female per 1000 male	941

Physiography of the state

Odisha is an extensive plateau with slopes gently into coastal plain along the Bay of Bengal. The river Mahanadi is flowing west to East through the plateau divides the state into Chhotnagpur plateau and Southern part is a part of Eastern hat region. The state has been divided into ten Agro climatic zones.

Agro-climatic zones of Odisha:-**Table 3.2(agro-climatic zones of Odisha)**

SI No.	Agro-climatic zone	Climatic condition	Mean annual Rainfall (in mm)	Soil group
1	North-Western plateau	Hot and moist	1648	Red and yellow
2	North-central plateau	Hot and moist	1535	Red and loamy
3	North-eastern plateau	Hot and moist	1568	Alluvial
4	East and south –east coastal plain	Hot and humid	1449	Coastal alluvial saline(near the coast line)
5	North-east ghat	Hot and moist sub-humid	1597	Laterite and brown forest
6	Eastern ghat high land	Warm and humid	1522	Red
7	South eastern ghat	Warm and humid	1522	Red, red and yellow mixed
8	Western undulating	Warm and moist	1527	Black, mixed red and black
9	West-central table land	Hot and moist	1527	Red, heavy texture coloured
10	Mid-central table land	Hot and dry sub-humid	1421	Red loam laterite and black

Source: publication division D.E and Odisha

Dhenkanal district comes under sub-humid to humid eastern and south eastern upland Agro-ecological sub region and its Agro-climatic zone is Eastern plateau and Hill region.

Climate and Environmental situation

The State lies in the sub-tropical belt. The chief characteristics of the climate is high temperature and high Rainfall. The defined seasons in the state are hot dry summer March to May, Monsoon – June to October and Winter- November to February.

Table 3.3(Climatic condition of the district):

Sl No.	Climatic parameter	Dhenkanal	Odisha
1	Average rainfall	1428.8	1482.2
2	No. of Rainy days	53.5	72.2
3	Average maximum temperature	36°C	34.8°C
4	Average minimum temperature	21°C	17.1°C
5	Relative Humidity	77%	77.3%

As observed from the table, district Dhenkanal has less rainfall and no. of rainy days, high maximum and also high minimum temperature as compared to state average.

Rainfall:

The average annual Rainfall of the state is about 1500mm with an average of 73 rainy days out of which around 1386mm rain received during monsoon season that is June to October with average 14-18 rainy days per month. Drought, cyclone and flood are the usual calamities of the state.

Topography:

The geographical area of Dhenkanal district is 1482.2 square kilometer. The district can be divided into 3 natural divisions. These are Southern hilly region, the river vallies with tributaries, and the northern hilly region.

Rivers:

River Baitarani passes through the district before meeting Bay of Bengal. Two smaller rivers Sapua & Badajora originate from Hindol block and pass through

Odapada and Sadar blocks before meeting Mahanadi. Another river Ramiala originates from Kankadahad Block and flows through Kamakhyanagar and Bhuban Blocks and has confluence with Baitarani. Baitarani is a perennial river whereas the other three generally dry up during summer.

Soil:

The predominant soil groups found in the district are mixed red, Laterite, Black, clay and heavy clay and alluvial soils. The soil in general has a higher content of clay. During summer the soil cracks and becomes sticky due to the mud content

Forest:

The forest in Dhenkanal can be classified under the following four categories:

1. Reserve Forests	-	1,141.02 sq. kms.
2. Demarcated Protected forests	-	13.79 sq. Kms.
3. Unclassified Forests	-	0.04 sq. Kms.
4. Other Forests		<u>582.78 sq. Kms.</u>
TOTAL		1,737.63 sq. Kms.

As per report, the forest spreads over 39% of the geographic area of 4452 sq. kms. However, according to forest survey of India (survey of 2001), the actual forest area is 1445 sq. kms. and reserve forest is 1,141.02 sq. kms. Which is about 25.62% of the geographical area of the district.

About 40% people of the district are dependent on forests for their livelihoods. Important forest products are kendu leaves, sal seeds, siali leaves, sal leaves, char seeds, bela, marking nuts, mahua flower, mahua seeds, karanga seeds, kochila seeds, simuli cotton, honey, neem seeds, sal resin etc. During the last three years, Forest Department has provided about 5 lakh of mandays in different development works. Under joint forest management approach, 268 Vana Sanrakhyan Samitis (VSSs) have been formed in all ranges and blocks. The approach has been proved successful.

Dhenkanal is one of the few districts where actual forest coverage is gradually increasing. Dhenkanal district has successfully experimented with plantation of

cashew and mango. The district produces about 4000 m. tons of cashew and 39625 m. tons of mango annually

Road connectivity:

The connectivity within the district need considerable improvement. Although most of the GPs. are being connected to the block headquarters, it is not all weather connection. Many of the villages are either not connected to the GP headquarters or connected by fair weather roads. Since the last few years, quite a few roads have been taken up under PMGSY and efforts are being made to improve rural connectivity. Under SGRY internal village roads are made concrete.

Table 3.4 Details of Road in Dhenkanal District (2001-02)

National Highway	State Highway	Major District Roads	Other District Roads	Forest Roads	Gram Panchayat Roads	Classified Village Roads	P.S. Roads	Village Roads
164 k.m	05 k.m	119 k.m	119 k.m	142 k.m	213 k.m	5670	628 k.m	516 km

Source: District Statistical Handbook

Basic information about Dhenkanal district:

Dhenkanal district is an administrative division of Odisha, India. It is bordered by Keonjhar to the North, Jajpur to the East, Cuttack to the South and Anugul to the West. Dhenkanal is present above 249m from the mean sea level. Dhenkanal town, the district head quarter has a cluster of temples, Archeological remains and a medieval fort.

Table 3.5(district at a glance):

SI No.	Parameters	Unit	Magnitude
1	Total population	Number	1,192,948
2	Male population	Number	612,597
3	Female population	Number	580,351
4	Population growth rate	Percentage	11.82
5	Population density	Population per km ²	268
6	Literacy rate	Percentage	79.41
7	Male literacy	Percentage	87.08
8	Female literacy	Percentage	71.40
9	Total literate	Number	841,988
10	Male literate	Number	471,681
11	Female literate	Number	370,307
12	Sex ratio	Female per 1000 male	947
13	Child sex ratio	Female per 1000 male	870
14	Proportion to Odisha population	Percentage	2.84

Administrative set-up of the study area:

Table 3.6(administrative set-up of the study area):-

SI No.	Set-up	Dhenkanal	Odisha
1	Sub-divisions	3	58
2	Tahasils	6	171
3	No of CD blocks	8	314
4	No of Gram panchayat	199	6234
5	Total no of villages	1221	51349

The district has been divided into three sub divisions - Dhenkanal Sadar, Hindol and Kamakhyanagar - eight Community Development blocks, 199 Gram Panchayats (GP) and has 1221 villages.

Banking:

Dhenkanal district has 26 nos. of Rural Banks and 37 branches of various public sector banks with a density of 71 sqr. kms. Per bank.

Table 3.7 Credit – Deposit Ratio of the district:

Parameters	Public Sector Banks	Regional Rural Banks	Total
1. Branches	37	26	63
2. Deposits (Rs. in Lakhs)	28126	8600	36726
3. Credit (Rs. in Lakhs)	9075	6656	15730
4. Credit – Deposit ratio	32.27%	77.40%	42.83

Source: District Statistical Handbook

It is evident from the above figures that the credit – deposit ratio of regional rural banks is more than double of the public sector banks. The above data are also indicative of poor state of rural enterprise and commerce of the district.

LAND

The landholding pattern in over half the district is conspicuously small. Out of the total sown area of 1,32,522 ha. The land holding of marginal and small farmers is 61%, totaling an area of 80,627 ha. Due to the continuous splitting of joint families

the land holdings are getting smaller and smaller. This pattern of land holding itself is a cause of rural poverty.

Table 3.8 land utilization pattern:

Pattern of land utilization	Area in ha.
Geographical Area	430477
Forest Area	54400
Misc. Trees & Groves	9324
Permanent pasture	12272
Cultivable waste	24860
Land put to Non-agricultural use	30913
Barren & Unculturable Land	1 1138
Current fallow	27038
Other fallow	29542
Net area sown	132522

Source: District Statistical Handbook

Sources of irrigation:

The district under study, Dhenkanal is rain fed. The sources of irrigation in this district and selected clusters for study are dug well, tube well, water harvesting structures, lift irrigation point and few area coverage in the head reach regions of minor irrigation projects.

Irrigation:

In Dhenkanal district, the irrigated area is less than 24% of the total cultivable area of 1, 49,755 hacter - Much less than the state average of 35%.

Both ground water and rainwater is used for irrigation purposes. Number of existing ground water structures for irrigation is as follows:

Out of the net sown area of 1,32, 522 ha. over 67% of the area is dependent on south-western monsoon rainfall.

Canal irrigation is available from the Dadaraghati, Ramiala and SapuaBadajore irrigation projects. Parjang branch canal of Rengali Major Irrigation Project is irrigating about 7500 ha. of land in Dhenkanal district.

Occupational pattern:

The occupation of inhabitants of this district is mostly Agriculture. But due to scarcity of plain and fertile land substantial agro products are not yielded in this district. Besides a few the people of labour class are also engaged in other occupations viz. factory labourers, labourers in construction works, collection of forest materials, grazing of cattle's etc. Few people are engaged in business or in employment.

Socio-Economic profile:

Social life is the indicator of economic status of a community. Though the district has rich socio cultural background but the economic status is not sound. Poverty stands as a barrier in the path of progress. Due to illiteracy of people most of the Govt., Non-Govt. policies cannot reach the grass root level. Most of the people adopt hand to mouth policy.

Majority of the households of the district are BPL, i.e. 1,27,159 (about 63% of the total rural households), whereas the state average of BPL households is 47.5%.

Table 3.9 Agricultural Land distribution of Dhenkanal:

SI No	Parameters	Area in hactors
1	Geographical Area	4,30,477
2	Cultivated Area	1,83,81
3	High land	91,321
4	Medium land	52,184
5	Low land	40,336
6	Paddy Area	95,374
7	Non-paddy Area	88,467
8	Kharif irrigation potential	72,379
9	Rabi irrigation potential	24,298

Cropping pattern of Dhenkanal

Table 3.10 Area under different crops:

Area under different Crops		Area in Hacter	Production in MT
Cereals	Autumn Rice	15637	9479.70
	Winter Rice	108248	99149.00
	Summer Rice	1010	2572.30
	Total Rice	124895	1,11,2010.00
	Maize	159	138.50
	Ragi	67	20.70
	Wheat	24	23.80
	Total Cereals	1,25,145	1,11,264.00
Pulses	Mung	1669	214.90
	Biri	2776	422.90
	Kulthi	1254	238.30
	Total Pulses	5699	876.10
Total Food grains		1,30,844	1,12,140.10
Oil Seeds	Ground Nut	5789	4201.00
	Sesamum (Til)	1634	1431.00
	Mustard	52	21.00
Total Oil Seeds		7475	5653.00
Vegetables	Khariff	29358	96,500
	Rabi	15647	1,93,000
	Summer	4570	48,250
Total Vegetables		49575	3,37,750
Cash Crops	Sugarcane	554	291709
	Cashew	5000	4000
	Mango	6340	39625
	Banana	540	13500
	Lime	250	2000
Total Cash Crops		12,684	3,50,834
Condiments & Spices	Chillies	3739	374
	Ginger	645	64.5
	Turmeric	1132	135
Total Condiments & Spices		5,516	452

Source: Directorate of Economics & Statistics, Orissa and District Horticulture Department.

In Dhenkanal district paddy is the principal crop, which is grown in 94% of net sown area. All types of paddy (Early, Medium and late varieties) in Kharif and Dalua in summer is grown in the district. The other important crops grown in the district are oil seeds (5.64% of the net sown area) followed by pulses, which is grown in 4.30%, vegetable in 11% and other food crops like spices and condiments etc.

Among the pulses, Green gram (Mung), Black Gram (Biri) and Horsegram (Kulthi) are cultivated. Mung and Black Gram are cultivated in the later part of November in rain fed belts using the residual moisture in the fields. In Kharif these crops are also grown in irrigated area after harvesting of the Kharif crop.

The oilseeds, primarily Til and groundnut are grown in Kamakhyanagar, Dhenkanal Sadar and Bhuban Blocks. Oil seeds are grown both in Rabi and Kharif seasons. Sugarcane is grown in some parts of the district where irrigation facilities are available.

Vegetables like onion, ladies finger, cucumber, pumpkin, cow pea, bitter gourd, tomatoes, cauliflower, brinjal etc. are grown in the district.

Table 3.11 per hacter productivity of main crops (Qt/Hac):

Rice	Wheat	Maize	Mung	Biri	Arhar	Ground nut	Til	Sugar cane
8.9	9.92	5.63	1.28	1.22	7.29	7.82	1.39	526.55

Source: Director of Economics & Statistics

CONCEPTUAL FRAMEWORK

The conceptual framework of the study is discussed here.

Impact study:

“A comparison between what actually happened and what would have happened in the absence of the intervention.”

The Impact Study assessed the performance of the projects and programmes focusing on the following evaluation issues:

Effectiveness: Have the goals been attained?

Efficiency: What is the return of investment?

Impacts: What has happened as a consequence of the project outputs?

Additionally: What has happened which wouldn't have happened otherwise?

Relevance: How important are these impacts for all parties and audiences concerned?

Progress factors: which factors have affected the progress of the projects?

Socio-economic status:-

Socioeconomic status (SES) is an economic and sociological combined total measure of a person's work experience and of an individual's or family's economic and social position in relation to others, based on income, education, and occupation. When analysing a family's SES, the household income, earners' education, and occupation are examined, as well as combined income, versus with an individual, when their own attributes are assessed.

Socioeconomic status is typically broken into three categories, high SES, middle SES, and low SES to describe the three areas a family or an individual may fall into. When placing a family or individual into one of these categories any or all of the three variables (income, education, and occupation) can be assessed. Additionally, low income and little education have shown to be strong predictors of a range of physical and mental health problems, ranging from respiratory viruses, arthritis, coronary

disease, and schizophrenia. These may be due to environmental conditions in their workplace, or in the case of mental illnesses, may be the entire cause of that person's social predicament to begin with.

Education in higher socioeconomic families is typically stressed as a more important in topic in the household and local community. In poorer areas where food and safety are priority education can take a backseat. While youth audiences are particularly at risk for many health and social issues in the United States such as unwanted pregnancies, drug abuse, and obesity.

Component of socio-economic status:-

INCOME

Income refers to wages, salaries, profits, rents, and any flow of earnings received. Income can also come in the form of unemployment or workers compensation, social security, pensions, interests or dividends, royalties, trusts, alimony, or other governmental, public, or family financial assistance.

EDUCATION

Education also plays a role in income. Median earnings increase with each level of education. As conveyed in the chart, the highest degrees, professional and doctoral degrees, make the highest weekly earnings while those without a high school diploma earn less. Higher levels of education are associated with better economic and psychological outcomes (i.e.: more income, more control, and greater social support and networking)

OCCUPATION

Occupational prestige as one component of SES, encompasses both income and educational attainment. Occupational status reflects the educational attainment required to obtain the job and income levels that vary with different jobs and within ranks of occupations. Additionally, it shows achievement in skills required for the job.

National horticulture Mission:

Horticulturists apply their knowledge, skills, and technologies used to grow intensively produced plants for human food and non-food uses and for personal or social needs. Their work involves plant propagation and cultivation with the aim of improving plant growth, yields, quality, nutritional value, and resistance to insects, diseases, and environmental stresses. They work as gardeners, growers, therapists, designers, and technical advisors in the food and non-food sectors of horticulture.

The NHM's key objective is to develop horticulture to the maximum potential available in the state and to augment production of all horticultural products (fruits, vegetables, flowers, plantation crops, spices, medicinal aromatic plants) in the state. Other objectives include:

1. To provide holistic growth of the horticulture sector through an area based regionally differentiated strategies
2. To enhance horticulture production, improve nutritional security and income support to farm households
3. To establish convergence and synergy among multiple on-going and planned programmes for horticulture development
4. To promote, develop and disseminate technologies, through a seamless blend of traditional wisdom and modern scientific knowledge
5. To create opportunities for employment generation for skilled and unskilled persons, especially unemployed youth

Independent variables:

Certain attributes are the part of personality of human as a socialized individual and they predispose him to act in a manner towards social objects.

Age:

Age is defined as the extent to which an individual is old at the time of interview. Persons younger in age are likely to be progressive and more innovative. Earlier studies indicated that the age of the people was negatively associated with adoption of practices (Earnest, 1973; Kapse, 1976 and Kumar,1976).

Hence, it was assumed that age as a factor, might affect the livelihood systems.

Caste:

Caste is any of the hereditary, endogamous social classes or subclasses of traditional Hindu society, stratified according to Hindu ritual purity.

Caste is a form of social stratification characterized by endogamy, hereditary transmission of a style of life which often includes an occupation, ritual status in hierarchy and customary social interaction and exclusion based on cultural notions of purity and pollution.

Family type:

Families are legally bound through marriages, adoptions, and guardianships, including the rights, duties, and obligations of those legal contracts.

A family is a group of people affiliated by consanguinity, affinity, or co-residence.

Sahay(1969) stated that family may be nuclear or joint. Nuclear family may be defined as the social group, consisting of a married man and woman with their children living together under the same roof and sharing a common heart.

Joint family was defined by Sahay (1969) as the social group, consisting of several related individual families, especially those of a man and his son or of a woman and her daughter residing in a single large dwelling or a cluster of smaller ones.

It may be stated that the family type might have influenced the level of adoption.

Family size:

Chandrasekharan (1961)in his study found that a family of 3 to 4 children were considered as an ideal family size .Economic considerations were identified as

the main reasons for adopting family planning. It is presumed that family size might have influenced the level of adoption.

House type:

Residential dwellings can be built in a large variety of configuration. It can be of kuchha, Semipucca and pucca.

Education:

Beal and Sibley(1967) have pointed out that the individual's ability to read and write and the amount of formal education he possess will affect the manner in which the individual gathers data and relates himself to the environment.

Education is the act or process of acquiring knowledge systematically during childhood and adolescence.

It can be assumed that formal educational qualification of the people will affect the level of adoption of livelihood.

Size of holding:

It refers to actual farm size operated by the respondents.

Studies in adoption and diffusion have indicated that size of land holding in most cases is positively and significantly related with adoption of improved practices(Kumar,1976 and Sinha,1978).

Annual Family income:

Nickel and Dorsey(1967) defined family income is a stream of money, goods, services and satisfaction that come under the family to be used by them to satisfy their needs and desires and to discharge obligations.

Cosmopoliteness:

Cosmopoliteness is the ideology that all human ethnic groups belong to a single community based on a shared mortality.

It refers to more inclusive moral, economic and/or political relationship between individuals of different organization.

Social participation:

Social participation mostly focused on the person's involvement in activities providing interactions with others in society or the community.

It is usually principal work or business ,especially as a means of earning a living.

Extension Contact:

Extension contact is very important to any group or individual for its proper growth in its own profession. Transfer of technology depends upon frequent contact with friends and neighbours. So it is expected that one must come in contact with extension agencies and friends and neighbors regularly. An attempt was made to find out the extent of contact of the sample respondents with extension agencies working in the area under study

Material possession:

It is the number of things possessed by the respondents at the time of study.

Livestock possession:

It is the no. of livestock possessed by the respondents at the time of study.

Dependent variables:

Knowledge:

It has been operationalized as the cognitive behavior of respondents in test situation. It is the extent of awareness about different package of practices of crop production, animal husbandry, forest activities and vocational enterprise.

Attitude:

Thurston (1946) defined attitude as the degree of positive or negative effect associated with some psychological aspects. It includes the positive and negative feelings of the respondents on different activities.

Skill:

It is the technique of doing particular practice.

Constraints:

These are the circumstances which prohibit the farmers from adopting improved farm practice technology.

RESEARCH METHODOLOGY

This chapter deals with the research methods and procedures followed by the researcher to analyse the problem during the course of investigation. The details of the methods and procedures used in this study along with the plan of statistical analysis have been outlined under the following headings.

1. Selection of problem
2. Research design
3. Location of the study
 - Selection of districts
 - Selection of blocks
 - Selection of villages
 - Selection of respondents
4. Tools and techniques of data collection
 - Pilot study
 - Development of the interview schedule
 - Pre-testing of interview schedule
 - Interview
5. Variables and their measurement
6. Statistical measures

Sampling procedure:

- ▶ Four Blocks were selected as in every blocks the NHM programme is implemented. These Blocks are Dhenkanal sadar and Kankadahad, Kamakhyanagar, Hindol.
- ▶ Three adopted Villages each from 4 Blocks were selected randomly totaling four villages.
- ▶ Dhenkanal district is selected purposively. Four sample Blocks Hindol, kamakhyanagar, kankadhada, Dhenkanal sadar and twelve sample villages namely Saptasajya, Sankarpur, Alabareni, Bhalumunda, Khatuahata, Rasola, Talamulu, Palachakada, Kaimati, Sasapashi, Karagola, Dangapala are selected randomly.
- ▶ 10 beneficiaries from each sample villages will be selected by using random table.

1. selection of problem

One of the most important factors in social research is the selection and conceptualization of research problem. Research worker should pay much attention towards the formulation of a realistic, clear and unambiguous problem since the delineation of problem is often more important and essential than its solution .The research problem named “Impact of NHM on socio-economic development of Farmers of Odisha.” was selected keeping proper attention to the various factors like socio-economic factors, psychological factors, skill enhancement, socio-economic development and difficulties faced in the project.

2. Research design

Keeping in view the objective of the study more of qualitative and behavioral attributes are needed to be included in the study. For the study, survey research was considered most appropriate to gather data. Multiphase sampling technique was adopted to select the districts, blocks, villages and respondents.

3. Location of the study

The sample of the research study covers Dhenkanal district. Four blocks from Dhenkanal district were selected for the study. From each block three villages were selected for the study comprising twelve villages from the district.

4. Selection of the district

Odisha state comprises of 30 revenue districts. The district Dhenkanal was selected purposively as it is my home district. The main factor which was taken into consideration that was the Impact of NHM on socio-economic development of Farmers of Odisha.

5. Selection of Blocks

Dhenkanal district comprises of 8 community development blocks. Out of which 4 blocks namely Dhenkanal sadar and Kankadahad, Kamakhyanagar, Hindol were selected randomly as the NHM project is implemented in all blocks.

6. Selection of villages

Four villages from each block were selected randomly. The villages are: Saptasaya, sankarpur, kaimati, Anlabareni, Bhalumunda, Khatuahata, Rasolo, Talamulu, Palachakada, Sasapashi, Karagola, Dangapali.

7. Selection of respondents

A preliminary survey of the selected villages was carried out and the selection of respondents was done. For selecting the respondent proportionate random sampling technique was carried out because the number of beneficiaries in each village varies. Thus 10 beneficiaries from each village were selected as respondents.

Table 5.1.Selection of respondents:

Block	Village	No. of beneficiaries
DHENKANAL SADAR	SAPTYASAJYA	10
	SANKARPUR	10
	KAIMATI	10
KAMAKHYA NAGAR	ANLABARENI	10
	BHALUMUNDA	10
	KHATUAHATA	10
HINDOL	RASOLA	10
	TALAMULU	10
	PALACHAKADA	10
KANKADAHAD	SASAPASHI	10
	KARAGOLA	10
	DANGAPALA	10

8.Tools and techniques for collection of data:

8.1. Pilot study

Prior to finalization of the variables and preparation of interview schedule the investigator made visit to selected villages of the project implemented areas of Dhenkanal. Discussions and interactions were made with the beneficiary farmers, VAWs and Govt. officials. The investigator also interacted with the principal investigator, scientists and SRFs to collect information about the villages and the NHM project. The data so collected helped the researcher for finalization of variables and interview schedule.

8.2. Development of interview schedule

In course of preparation of interview schedule many proposals were added and discarded after judging each item with their possible linkage with the specific objectives of the study. The pertinent questions were taken into consideration whereas questions having less validity and reliability were dropped. Repeated verification and proper measures were taken to avoid vague and ambiguous answers.

8.3. Pre-testing of interview schedule

In order to study the validity and reliability of the schedule, pre-testing of the same was made at random with nearly 10% of the respondents other than the selected sample respondents of the study. Basing on the information collected, some minor modifications were made in the schedule and the final schedule was developed and finally used for collecting the information.

8.4. Interviewing

The respondents were personally interviewed by the researcher with the use of structured interview schedule. The interview was conducted at the respondents' work place or at their residence in a most informal manner. Before the interview the respondents were contacted personally for the establishment of rapport. Personal interview and focused group discussion techniques were used for collection of information. Some secondary information data was also gathered from village headman, local officials and youth leaders.

Variables and their measurement:

Socio-economic variables:

Independent variables:

Table 5.2. Measurement procedure:

SI No.	Variables	Empirical measurement
1	Age(x_1)	Schedule developed for the study
2	Caste(x_2)	Schedule developed for the study
3	Family type(x_3)	Trivedi(1963)
4	Family size(x_4)	Schedule developed for the study
5	House type(x_5)	Trivedi(1963)
6	Education(x_6)	Schedule developed for the study
7	Size of holding(x_7)	Venkatramaiah and Sethureol
8	Annual family income(x_8)	Schedule developed for the study

9	Cosmopolitaness(x_9)	Schedule developed for the study
10	Social participation(x_{10})	Schedule developed for the study
11	Extension contact(x_{11})	Schedule developed for the study
12	Material possession(x_{12})	Schedule developed for the study
13	Livestock possession(x_{13})	Schedule developed for the study

Age(x_1):

Age is operationalized as the number of full years completed at the time of investigation .It was categories into three categories and scored accordingly.

Table 5.3 scoring of age category of respondents:

Categories	Score
Upto 30 years(young)	1
30-50 years(middle aged)	2
Above 50 years(old)	3

Caste(x_2):

Caste is an endogamous and heredity sub-division of an ethnic unit(Kroeber1948).Caste related to the status of an individual in the society by birth and its exclusive and functional group of which the individual respondent belongs. The score assigned to the caste structure is as follows.

Table 5.4 scoring of Caste category of respondents:

Caste	Score assigned
General	4
OBC	3
SC	2
ST	1

Family type(x₃):

According to Sahay (1969), family may be nuclear or joint. He defined nuclear family as the social group consisting of a married man and a women with their children living together under the same roof. Joint family was defined by him as “consisting of several related individual families, especially those of man and his sons in case of patriarchal family or of a women and her daughters in case of matriarchal family in a single large dwelling or a cluster of small ones.” Here the term “joint” was applied to family having at least two related individual families living in a common residence.

Family type was measured by the scale developed by Trivedi (1963).

Table 5.5 scoring of family type of respondents:

SI No	Item	Score
1	Nuclear family	1
2	Joint family	2

Family size(x₄):

It refers to the number of individuals within a family. To count the family size, actual number of members in the family was taken into consideration

Table 5.6 scoring of family size of the respondents:

Category	No. of members	Scores
Small family	Upto 5 members	1
Medium family	6-8 members	2
Big family	More than 8 members	3

House type(x₅):

It indicates the type of house he resides. The scoring was done using the scale developed by Trivedi (1963).

Table 5.7 scoring of house type of the respondents:

Item	Score
Kuchha	1
Semi pucca	2
Pucca	3

Educational status(x₆):

It has been operationalized as the extent of literacy obtained by the respondents at the time of investigation.

Table 5.8 scoring of educational category of respondents:

Categories	Score
Illiterate	1
Can read and write	2
Upto primary level	3
Upto secondary level	4
Graduate	5
Post graduate & above	6

Size of holding(x₇):

It refers to land possession of the individual farmer family.

Table 5.9 scoring of size of holding of the respondents:

Category	Score
Landless	1
Marginal farmer(upto 1ha)	2
Small farmer(between 1-2 ha)	3
Big farmer(above 2ha)	4

Average Annual family income(x₈):

Experience tells that economically sound men are better adopter in all aspect of development. Sound background increases the risk bearing ability of farmers. Hence these are the important aspects to affect the income of farmers' family.

Average annual income is the total amount of money coming from all the sources to a family per year.

Table 5.10 scoring of annual family income by the respondents:

Annual income in Rs	Score
<25,000/-	1
25,001/- to 50,000/-	2
50,001/-to 1 lac	3
>1 lac	4

Cosmopoliteness(x₉):

It was the outward orientation of the respondents outside self-community.

Table 5.11 scoring of cosmopoliteness of the respondents:

Parameters	Score
Frequently	3
Occasionally	2
Never	1

Social participation(x₁₀):

It refers to the membership in various organizations and institutions by the respondents.

Table 5.12 scoring of social participation of respondents:

Parameters	Score
Yes	1
No	2

If yes then

Table 5.13 scoring of social participation of respondents

Parameters	Score
Membership in 1 organization	1
Membership in more than 2 organization	2
Office bearer	3

Extension contact(x_{11}):

Extension contact is very important to any group or individual for its proper growth in its own profession. Transfer of technology depends upon frequent contact with friends and neighbours. So it is expected that one must come in contact with extension agencies and friends and neighbors regularly. An attempt was made to find out the extent of contact of the sample respondents with extension agencies working in the area under study

Table 5.14 scoring of Extension contact by the respondents

Parameters	Score
Frequently	3
Occasionally	2
Never	1

Material possession(x_{12}):

The information pertaining to the material available with respondents is obtained and their type is considered for scoring material possession.

Table 5.15 scoring of Material possession by the respondents:

Item	Score
House hold duration	1
Cycle	2
Motor cycle	3
Radio	4
Television	5

Livestock possession(x₁₃):

The information pertaining to the bovine population available with respondents is obtained and their type is considered for scoring livestock possession.

Table 5.16 scoring of livestock possession by the respondents:

Item	Score
Bullock	1
cows	2
goats	3
poultry	4

Then according to the mean value respondents were categorized into two categories i.e having high livestock possession and low livestock possession.

Dependent variables:

Skill:

The term skill may be defined as” the ability comes from one’s knowledge, practice, aptitude etc. to do something well” .In other words, it is the proficiency in performance of some task. Then frequency and percentage were calculated on basing on scores.

Table 5.17 scoring of skill of the respondents:

Category	Score
Strongly agree	5
Agree	4
Undecided	3
Disagree	2
Strongly disagree	1

Attitude:

Attitude means it is the behavior of respondents towards particular practices. For the purpose of the present study attitude was operationally defined as the degree of individual respondents towards improved practices. It was calculated by using five point scale.

Table 5.18 scoring of attitude of the respondents:

Category	Score
Strongly agree	5
Agree	4
undecided	3
Disagree	2
Strongly disagree	1

Knowledge:

Knowledge is the degree of concept of knowing something practices or technology. It is determined in various crop production, forest management, vocational enterprises etc. by three point scale. This is categorized as follows.

Table 5.19 scoring of knowledge of respondents:

Category	Score
Know well	3
Know to some extent	2
Do not know	1

Activities performed:**Statistical measures:**

It provides the investigator with the opportunity of expressing the facts in an imperial way. The statistical measurement which had been used in this study were:

- Frequency
- Percentage
- Mean
- Mean score
- Rank order

Frequency:

The number of individuals or observations in each class of attributes /variables is called frequency of that class of variable. The arrangement of frequencies in different classes of a variables is called the frequency distribution of the variables.(Gupta,2000)

Percentage:

Percentage was used in description analysis for making simple comparison between two responses. For calculating percentage, the frequency of a particular cell was multiplied by 100 and divided by the total number of respondents.

Mean:

Arithmetic mean ($\bar{x}$) of a variable is obtained by dividing the sum of all the variety values of a series of observations by the total number of observations. Thus, if there are n observations of a variable, x having values $x_1, x_2, \dots, x_n$ then

$$\text{Arithmetic mean}(x) = \frac{x_1 + x_2 + \dots + x_n}{N}$$

Mean score:

It is also simple comparison which was calculated by using the formula-

$$\text{Mean score} = \frac{\sum fx}{N}$$

Summation of frequency(f) multiplied with N =sum of total score obtained by individual.

N=total no. of respondents

Ranking:

Ranking is an expression of people's priority about their thoughts and feelings. Ranking was done by assigning the first rank to highest mean score and the second rank to the next highest mean score and so on.(The mean score for a particular factor was worked out separately for the two area by dividing *the* weighted score of the factor with the total no. of respondents.)

CR Value:-

It is calculated the significance of difference between the two percentage.

$$R = \frac{\text{Difference between } p_1 \text{ and } p_2}{\sqrt{pq [1/n_1 + 1/n_2]}} \quad p = \frac{n_1 p_1 + n_2 p_2}{n_1 + n_2}$$

n_1 = size of 1st sample n_2 = size of 2nd sample $q = 100 - p$

p_1 = percentage of 1st sample & p_2 = percentage of 2nd sample

RESULT AND DISCUSSION

The research study entitled “Impact of NHM on Socio-economic Development of Farmers of Odisha.” was carried out in Dhenkanal district of Odisha. A sample size of 120 respondents from 12 villages covering four blocks equally were randomly selected for the study. The respondents were personally interviewed with a structured schedule pre-tested earlier.

The result of the study has been presented in accordance with the objectives. The findings & interactions had been cited together to make inferences meaningful. The result is presented under the following sections as per the objectives.

- To study about the socioeconomic characteristics of farmers with specific reference to horticulture enterprise.
- To assess the knowledge and skill development of farmers after availing the benefits of NHM.
- To assess the effectiveness of NHM programme for improvement of socioeconomic condition of farmers.
- To study about the constraints faced by the farmers in operation of NHM programme.
- To present some case study on implication of NHM programme

Objective1 - Study about the socioeconomic characteristics of farmers with specific reference to horticulture enterprise:

Social research concentrates more on socio-economic variables, so the effect of those variables on the dependent variable was found out.

(i)Age:

Age is the personal variable which determines the effect on various dependent variables. As per age category of the respondents is concerned the entire sample is divided into 3 categories such as young, middle aged and old age.

Table 6.1.1 (age distribution of the respondents):

SI No	Age category	Frequency	Percentage
1	Young(upto 30 years)	42	35
2	Middle aged(31-50 years)	66	55
3	Old(above 50 years)	12	10

It was observed from the table 6.1.1 that from the sample respondent of farmers, 35 percent belong to young category, 55 percent belong to middle aged category 10 percent belong to old category.

While analyzing the age categories of the beneficiary farmers, it was observed that the sample consists of more middle aged beneficiaries.

Hence, it may be concluded that the Research study was based on mostly the middle aged respondents. But in general it may be concluded that the information which was collected mostly on young and middle aged respondents.

(ii)Caste:

Our society is mostly caste structure which accepts considerable influence on adoption as well as rejection of improved technology. It also indicates the relative position of person in the society. Caste distribution of the respondents under NHM is presented in the table 6.1.2.

Table 6.1.2(caste distribution of the respondents):

SI No.	Caste	Frequency	Percentage
1	General	36	30
2	OBC	60	50
3	SC	12	10
4	ST	12	10

It can be observed from the table 6.1.3 that 30 percent of the beneficiaries were general, 50 percent were other backward category, 10 percent were belonging to SC category and only 10 percent were from ST category belonging to sample respondents.

It can be concluded that a majority of the beneficiaries were OBC and fewer were from SC/ST category.

(iii)Family type:

The family type of the respondents was studied and the data to this effect is present in the table below.

Distribution of the beneficiaries according to family type:

Table 6.1.3(family type of the respondents)

SI No.	Category	Frequency	Percentage
1	Nuclear	36	30
2	Joint	84	70

The data compiled in the table 6.1.3 indicated that out of 120 respondents 30 percent had nuclear type family whereas only 70 percent belonged to joint families. Due to demographic pressure and social conflict, majority of the joint families have been converted in to nuclear families. The brothers after marriage prefer to have their own family system. Findings suggest that there is change in mind of beneficiaries because they developed favorable attitude towards joint family system due to pressure of work load in various livelihood activities.

(iv)Family size:

The family size of the respondents was studied and presented in the table below.

Table 6.1.4 (Distribution of beneficiaries according to family size):

SI No.	Category	Frequency	Percentage
1	Small family	24	20
2	Medium family	60	50
3	Big family	36	30

It is observed from the table 6.1.4 that majority of the sample respondents were having medium family type, 30 percent were of big family type. A lower number of respondents that is 20 percent were having small family. It may be due to lower number of nuclear family type.

(v)House type:

It is the symbol of status in a society. Respondent with higher income from agricultural and allied fields live in better types of houses than their counterparts with lower status and income. An attempt was made to study the housing type of the respondents which is presented in the table below.

Table 6.1.5 (Distribution of respondents according to house type):

SI No	Category	Frequency	Percentage
1	Kuchha	18	15
2	Semipucca	60	50
3	Pucca	42	35

It is observed that most of the beneficiaries have Semipucca type of houses. Only 15 percent of beneficiaries are living still in kuchha type of house.35 percent of the respondents have pucca type of house.

From the findings it is clear that most of the beneficiaries were residing in type of house. Semipucca house was due to support given by Govt. as Indira bas yojna. But rest of respondents remain in kuchha or pucca type house as per their economic condition.

(vi)Education:

Education is always linked with the mental and psychological activity of the individual to understand and accept new ideas into action. It also influences the behavior of the individual and develops interest in new approaches. Hence education is one of the important independent variable for the developmental process. But the reality is that majority of the rural people are having low literacy level.

Table 6.1.6 (distribution of Educational standard of the respondents):

SI No.	Educational level	Frequency	Percentage
1	Illiterate	0	0
2	Can read and write	30	25
3	Upto primary level	24	20
4	Upto secondary level	54	45
5	Graduate	12	10
6	Post graduate & above	0	0

It was observed from the table 5.1.6 that 10 percent of total sample population belonged to graduate. 45 percent of the beneficiaries had education upto secondary level. 20 percent of the sample respondents were having education upto primary level. 25 percent of the sample respondents were can read and write. There was no illiterate & post graduate beneficiary among the sample respondents.

(vii)Size of Holding:

Size of holding is an indicator of growing different crops and richness of the respondents. Attempt was made to investigate about the size of holding of the sample respondents which are analyzed in table .

Table 6.1.7(Size of holding of the respondents):

SI NO	Category	Frequency	Percentage
1	Landless	0	0
2	Upto 1 acres	54	45
3	1 to 2.5 acres	36	30
4	2.5 to 5 acres	30	25
5	More than 5 acres	0	0

On the basis of the land holding, the respondents were categorized according to their landholdings ex- 1acres or more than 1acres .There were none of the respondents those were landless, 45 percent of the respondents have upto 1 acres of land, 30 percent have land between 1 acres to 2.5 acres. 25 percent farmers have 2.5 to 5 acres land. There was no sample respondent having more than 5 acre land.

Every respondent had more or less land holding and also they had a peculiar habit of raising their own food from their land.

In traditional system beneficiary farmers had less acre of land to cultivate but now they Approach for scientific cultivation in huge acres of land. That means more the size of holding, more the income, better was the status of living.

(viii)Annual family income:

Income of a family greatly influence the decision making process. The aspiration and goals of a respondents is dependent on annual income though it is very difficult to access the annual family income as they were not making any records. Still attempt was made to study the annual family income of the respondents in the area of study which is presented in the table:

Table 6.1.8(Distribution of average annual family income):

SI No	Category	Frequency	Percentage
1	Upto 25,000/-	0	0
2	25,001-50,000/-	42	35
3	50,001-1 lakh	66	55
4	Above 1 lakh	12	10

This table indicates that 35 percent of the sample respondents had annual income within 25,001 to 50,000.55 percent of the sample respondents had annual income within 50,001 to 1 lakh. There were 10 percent sample respondents which having annual income upto 25,000 or above 1 lakh.

(ix)Cosmopoliteness

Cosmopoliteness shows outward orientation of an individual. A person needs to be cosmopolite to have maximum degree of empowerment. More exposure to outside community enables a person to be more conscious, knowledgeable and progressive

leading to empowerment. Data collected on cosmopolitaness of the respondents were analyzed and presented in the table 6.1.8 below.

Table 6.1.9(Cosmopolitaness of the beneficiaries):

SI No	cosmopolitaness	Frequency	Percentage
1	Frequently	36	30
2	Occasionally	60	50
3	Never	24	20

It was observed from the table 6.1.9 that a majority of the respondents of the sample area had contact with the nearest town and city market occasionally. This might be due to sale of farm produce or purchase of household goods.

It was further observed that the respondents had regular contact with the district headquarter and the block headquarter.

(x)Social participation:

Social participation denotes the involvement of an individual in various social,religious,political,educational and cultural groups, and institutions.The individual having more social participation definitely will be resourceful,advanced and empowered.But,it is seen that rural people are having either less or negligible level of social participation which is mainly due to illiteracy and ignorance.The situation in this regard is still major in case of rural people due to long standing social norms and cultural taboo.For the reason the researcher was interested to know the social participation of the beneficiary farmers in context of their socio-economic status

Table 6.1.10(Social participation of the respondents)

SI No	Category	Frequency	Percentage
1	Membership in 1 Organization	90	75
2	Membership in more than 2 Organization	30	25
3	Office bearer	0	0

It can be observed from the table 6.1.10 that a little respondent was found to have any type of social participation (membership in formal and informal organization.),that is 50 percent of the sample respondents had no social partnership.

Out of other respondents 75 percent of the sample respondents had membership in 1 Organization, very few that is only 25 percent of the sample respondents were having membership in more than 2 organization. There were no respondents which are office bearer. Many farmers are member of most village level Organization in compare with block level and district level.

It is the matter of great concern that in primary sector like Agriculture, rural people are not linked with groups, organization and institutions. So, the level of awareness and exposure was definitely very poor which is a major bottleneck for the path of development.

The findings therefore concluded that the respondents on the study area had low social participation. So, it was presumed that the farmers kept them aloof from the social activities for which they were not feeling themselves empowered.

(xi) Extension Contact:

Extension contact is very important to any group or individual for its proper growth in its own profession. Transfer of technology depends upon frequent contact with friends and neighbours. So it is expected that one must come in contact with extension agencies and friends and neighbors regularly. An attempt was made to find out the extent of contact of the sample respondents with extension agencies working in the area under study

Table 6.1.11(Extension contact of the respondents)

SI No	Extension contact	Frequency	Percentage
1.	Frequently	36	30
2.	Occasionally	66	55
3.	Never	18	15

It was observed from the table 6.1.11 that a majority of the respondents of the sample area had moderate extension contact with the nearest extension agency. This contact was due to get technological help from extension personnel. It was further observed that the respondents had regular contact with the district level and the block level extension agency.

(xii) Material possession:

Attempt was made to study the possession of materials available with the sample respondents through open ended questions which were analyzed and presented in the table .

Table 6.1.12 (Distribution of beneficiaries on the basis of Material possession):

SI No	Category	Percentage
1	Low	27.5
2	Medium	30
3	High	42.5

Mean=10.03

SD= 2.67

It is seen from above table that 42.5 percent beneficiaries possessed high level of type of material possession for farming, 27.5 percent of respondents belonged to low category that is they had lower level of material possession. There were 30 percent respondent belonged to medium category of material possession.

(xiii) Livestock possession:

Table 6.1.13 (Distribution of livestock of the respondents):

SI No	Category	Percentage
1	Low	17
2	Medium	70
3	High	13

Mean=5.08

SD=1.77

This table indicates 17 percent of the sample respondents were having low livestock possession, 70 percent were having medium level of Livestock possession and 13 percent of the sample respondents were having high livestock possession.

This was because of their poor economic condition of the beneficiaries.

Objective-2: Study of the Knowledge of beneficiaries regarding objectives and activities of NHM.

I. Knowledge of beneficiaries regarding NHM:

The overall knowledge of the respondents on the objectives and activities of NAIP was examined. The relevant data were collected on a three point scale from all the 100 sample respondents & the mean scores as well as rank orders had calculated.

Table 6.2.1 (knowledge of beneficiaries towards objectives and activities of NHM):

SI No	Item	Do not know	Know to some extent	Know well	Mean score	Rank order
1	Meaning of NHM	83	33	4	1.34	IV
2	Year of initiation of NHM	100	14	6	1.21	VII
3	Objectives of NHM	80	40	0	1.50	II
4	Area of operation	90	15	15	1.37	III
5	Location of its implementing agency	106	14	0	1.11	VIII
6	Location of its headquarter	90	15	15	1.37	III
7	Name of the field staffs of the project	90	15	15	1.37	III
8	Name of the executive staffs of the project	100	10	10	1.25	VI
9	Different programmes of the project	60	30	30	1.75	I
10	Usefulness and effectiveness of the project	70	40	10	1.33	V

Average mean score=1.34

As the mean score obtained are greater than average mean score, in the aspects like, Meaning of NHM, area of operation, objective of NHM, location of headquarters, name of field staff of this project, different programmes of the project, usefulness and effectiveness of the project possessed better knowledge.

The above table revealed that most of the beneficiaries were well aware about the programme of the project for which they placed this item in the first rank. It means the field staffs were well known to them. Area of operation, Name of the field staffs of the project, Location of its headquarters were given as third rank. Meaning of NHM was given as fourth rank. Usefulness and effectiveness of the project was given

fifth rank. Name of the executive staffs of the project was given as sixth rank. Year of initiation of the project was given as seventh rank. Location of implementing agency was given eighth rank.

This ranking is the reflection of awareness of the beneficiaries towards NHM.

II. Purpose of involvement in the NHM:

The purpose of involvement of the beneficiaries in the NHM were recorded over a three point scale & the result have been presented below.

Table 6.2.2 (purpose of involvement of beneficiaries in NHM):

SI No	Item	Strongly agree	Agree	Disagree	Mean score	Rank order
1	Economic benefit	120	0	0	3	I
2	Social development	72	48	0	2.62	IV
3	Skill enhancement	65	36	15	2.35	V
4	Gathering upto date knowledge	83	35	2	2.67	III
5	To get the services of specialists	86	32	2	2.78	II
6	To be identified in the society	51	26	33	2.06	VII
7	Since I have been chosen to become the beneficiary	51	46	13	2.23	VI

Average mean score=2.53

Therefore it can be conclude that higher production leading to economic benefit, social development, gathering upto date knowledge, getting services of specialists were the important purpose of involvement by the beneficiaries in NHM.

Different aspects of purpose of involvement in the NHM were ranked as follows. To get economic benefit and to get higher production were given as first rank. To get services of the specialists was given second rank. Gathering upto date knowledge was given third rank. Social development was given as fourth rank. Skill enhancement was given as fifth rank. Since they had been chosen to become the beneficiary was given as sixth rank. To be identified in the society was given seventh rank.

III.Perception of beneficiaries towards NHM project:

Table 6.2.3(perception of beneficiaries towards NHM):

SI No	Item	Strongly agree	Agree	Disagree	Mean score	Rank order
A	NHM is a good technology transfer unit for development of farming community	78	22	20	2.48	III
B	The project deals with most important problems of the farming community	61	33	26	2.29	V
C	Beneficiaries get necessary help as per the objectives`	69	51	0	2.57	II
	Activities					
D	Farmers friendly and feasible for resource poor farmers	50	50	20	2.25	VI
E	The project has brought over a remarkable change over the living standard of the beneficiaries	61	46	13	2.40	IV
F	The training programme of the project are as per the needs of the beneficiaries	77	33	20	2.64	I
G	The project activities have brought change of non-beneficiaries	14	57	49	1.71	VII

Average mean score=2.33

As the mean score obtained are greater than the average mean score it can be said that the statements i.e.NHM is a good technology transfer unit for development of farming community,the project deals with most important problems of farming community,beneficiaries get necessary help as per the objectives,the project has brought over a remarkable change over the living standard of the beneficiaries, the training programme of the project are as per the needs of the beneficiaries etc. were important perceptions of beneficiaries towards NHM.

From the table 6.2.3it can be observed that the training program of the project are as per the needs of the beneficiaries was given first rank.Beneficiaries get necessary help as per the objectives was given second rank.NHM is a good technology transfer unit for development of farming community was given thirdrank.The project deals with most important problems of the farming community was given fourth rank.The project has brought over a remarkable change over the living standard of the beneficiaries was given fifth rank.Farmers friendly and feasible for resource poor farmerswas given sixth rank.The project activities have brought change of non-beneficiaries was given seventh rank.

IV. To access the knowledge development of farmers after availing NHM:-

1. Knowledge on nursery preparation –

Table 6.2.4(knowledge on nursery preparation):

Sl. No.	item	Strongly agree	Agree	undecided	Disagree	Strongly disagree	Mean score	Rank order
1.	Soli preparation in nursery.	60	30	10	10	10	4	I
2.	Nursery bed preparation	40	50	15	13	2	3.95	II
3.	Leveling of the nursery	10	30	60	15	5	3.20	IV
4.	Irrigation channel preparation in nursery	23	20	55	7	15	3.24	III

Average mean score= 3.59

The knowledge of farmer regarding nursery preparation had been increased due to different demonstrations of programme by field officers and the contact of farmers with extension personnel and programme officer.

This table clearly reflected the different parameters of knowledge of farmer regarding nursery preparation which was possible due to the implementation of NHM. The respondents ranked statements according to their experience.

The table intimated that the respondents ranked Soli preparation in nursery as first followed by Nursery bed preparation, Irrigation channel preparation in nursery, leveling of the nursery.

2. Plantation of fruit crops-

Table 6.2.5(Plantation of fruit crops)

Sl. No	Items	Strongly agree	Agree	undecided	Disagree	Strongly disagree	Mean score	Rank order
1.	Land preparation	8	66	36	6	4	3.56	I
2.	Patten of planting of fruits crop	5	40	65	5	5	3.29	II
3.	Use of Drip irrigation in plantation area	8	33	50	20	9	3.09	III

Average mean score= 3.31

This table clearly reflected the different parameters of knowledge of farmer regarding Plantation of fruit crops which was possible due to the implementation of NHM. The respondents ranked statements according to their experience.

The table intimated that the respondents ranked Land preparation as first followed by Patten of planting of fruits crop, Use of Drip irrigation in plantation area.

3. Post-harvest of fruits and vegetables

Table 6.2.6(Post-harvest of fruits and vegetables)

Sl. No	Items	Strongly agree	Agree	undecided	Disagree	Strongly disagree	Mean score	Rank order
1.	Sorting and grading of fruit and vegetables	8	66	36	6	4	3.56	IV
2.	Value addition to fruit and vegetables	70	30	10	10	0	4.33	I
3.	Packaging of the products	60	40	15	0	5	3.91	II
4.	Marketing of the value added product	50	20	20	15	10	3.58	III

Average mean score= 3.84

This table clearly reflected the different parameters of knowledge of farmer regarding Post-harvest of fruits and vegetables which was possible due to the implementation of NHM. The respondents ranked statements according to their experience.

The table intimated that the respondents ranked Value addition to fruit and vegetables as first followed by Packaging of the products, Marketing of the value added product, Sorting and grading of fruit and vegetables.

5. Protected cultivation and green house cultivation-

Table 6.2.7(Protected cultivation and green house cultivation)

Sl. No	Items	Strongly agree	Agree	undecided	Disagree	Strongly disagree	Mean score	Rank order
1.	Green house preparation	5	10	80	15	10	2.87	II
2.	Mulching in green house	12	20	70	9	9	3.14	I
3.	Maintain temperature and humidity in green house	20	30	10	10	50	2.66	III

Average mean score= 2.89

This table clearly reflected the different parameters of knowledge of farmer regarding protected cultivation and green house cultivation which was possible due to the implementation of NHM. The respondents ranked statements according to their experience.

The table intimated that the respondents ranked Mulching in green house as first followed by Greenhouse preparation, Maintain temperature and humidity in green house.

6. Organic farming

Table 6.2.8(Organic farming)

Sl.No	Items	Strongly agree	Agree	undecided	Disagree	Strongly disagree	Mean score	Rank order
1.	Principle of Organic farming	10	10	60	20	20	2.75	III
2.	Use of biological methods for controlling pests	5	10	80	15	10	2.87	II
3.	Use of azolla and BGA	50	20	20	15	10	3.58	I

Average mean score= 3.06

This table clearly reflected the different parameters of knowledge of farmer regarding organic farming cultivation which was possible due to the implementation of NHM. The respondents ranked statements according to their experience.

The table stated that the respondents ranked use of azolla and BGA as first followed by use of biological methods for controlling pests, principle of Organic farming.

7. Rearing of honey bee-

Table 6.2.9(Rearing of honey bee)-

Sl.No	Items	Strongly agree	Agree	undecided	Disagree	Strongly disagree	Mean score	Rank order
1.	Establishment of hives	10	10	60	20	20	2.75	II
2.	Proper rearing of queen	5	10	80	15	10	2.87	I

Average mean score= 2.81

This table clearly reflected the different parameters of knowledge of farmer regarding Rearing of honey bee which was possible due to the implementation of NHM. The respondents ranked statements according to their experience.

The table stated that the respondents ranked proper rearing of queen as first followed by establishment of hives.

8. Vermicomposting

Table 6.2.10(Vermicomposting)-

Sl.No	Items	Strongly agree	Agree	undecided	Disagree	Strongly disagree	Mean score	Rank order
1.	Waste material used for vermicomposting	5	12	75	20	8	2.88	IV
2.	Different types of vermicomposting	6	10	85	9	10	2.94	II
3.	Maintaining the ratio of earthworm and compost in tank	7	14	70	19	10	2.90	III
4.	Harvesting of compost	8	15	80	10	7	3.50	I

Average mean score= 3.05

This table clearly reflected the different parameters of knowledge of farmer regarding Vermicomposting which was possible due to the implementation of NHM. The respondents ranked statements according to their experience.

The table intimated that the respondents had ranked Harvesting of compost as first followed by maintaining the ratio of earthworm and compost in tank, different types of vermicomposting, waste material used for vermicomposting.

9. Mushroom cultivation

Table 6.2.11(Mushroom cultivation)

Sl.No	Items	Strongly agree	Agree	undecided	Disagree	Strongly disagree	Mean score	Rank order
1.	Preparation of spawn	20	30	10	10	50	2.66	IV
2.	Preparation of bed for mushroom cultivation	50	20	20	15	10	3.58	II
3.	watering in mushroom bed	20	30	10	10	50	2.66	IV
4.	Harvesting of mushroom	50	20	23	4	3	3.41	III
5.	Marketing of mushroom	10	80	20	7	3	3.73	I

Average mean score= 3.20

This table clearly reflected the different parameters of knowledge of farmer regarding mushroom cultivation which was possible due to the implementation of NHM. The respondents ranked statements according to their experience.

The table intimated that the respondents had ranked marketing of mushroom as first followed by preparation of bed for mushroom cultivation, harvesting of mushroom, watering in mushroom bed.

10. Integrated nutrient management –
Table 6.2.12(Integrated nutrient management)-

Sl.No	Items	Strongly agree	Agree	undecided	Disagree	Strongly disagree	Mean score	Rank order
1.	Concept of integrated nutrient management	23	20	55	7	15	3.24	II
2.	right proportion of nutrient	80	10	20	10	0	4.33	I

Average mean score= 3.78

This table clearly reflected the different parameters of knowledge of farmer regarding integrated nutrient management which was possible due to the implementation of NHM. The respondents ranked statements according to their experience.

The table intimated that the respondents had ranked right proportion of nutrient as first followed by concept of integrated nutrient management.

To assess the skill development of beneficiaries after availing the benefits of NHM.

Table 6.2.13(skill development of beneficiaries):

SI No.	Statement	Strongly agree	Agree	undecided	Disagree	Strongly disagree	Mean score	Rank order
1	Improvement in skills regarding nursery preparation.	0	90	10	10	10	3.50	V
2	Improvement in skills plantation of fruit crops.	5	86	24	5	0	3.75	II
3	Improvement in skills regarding postharvest management of fruits and vegetables.	2	50	35	18	5	2.96	XIV
4	Improvement in the skill in cultivation of rose and Gladiolus.	1	25	70	16	8	2.95	XV
5	Improvement in skills related to protected cultivation of planting materials and commercial flowers under green house	0	36	60	13	11	3.01	XIII
6	Increase in skills regarding organic farming	15	75	25	10	5	3.95	I
7	Improvement in skill regarding storage of Produce for long period.	2	60	40	10	8	3.31	IX
8	Increase in skills regarding creation of water resources through plastic lining.	3	80	25	8	4	3.45	VIII

9	Improvement in skills in maintainance of fruit crops	2	66	44	4	4	3.48	VII
10	Improvement in skills related to rearing of honey bee and extraction of honey.	8	33	50	20	9	3.09	XI
11	Improvement in skills regarding mushroom spawn production and practice of mushroom cultivation.	5	40	65	5	5	3.29	X
12	Improvement in skills regarding use of farm implements.	8	66	36	6	4	3.56	IV
13	Improvement in skills regarding efficient use and production of vermicompost	2	45	44	15	14	3.05	XII
14	Increase in skills in integrated nutrient management in fruit crops.	10	80	20	5	5	3.70	III
15	Increase in skills regarding handling and marketing of fruit, cut flower and loose flower.	7	65	35	6	7	3.49	VI

Average mean score =3.36

The beneficiaries improved their skills efficiently in the above programmes, which have mean score greater than average mean score i.e.3.36.

From the above table it can be depicted that farmer have given first rank to skills in organic farming followed by skill in plantation of fruit crops, skills in integrated nutrient management in fruit crops, skill in use of farm implements, skills regarding nursery preparation, skills regarding handling and marketing of fruit, cut flower and loose flower, skills in maintainance of fruit crops, skills regarding creation of water resources through plastic lining, skill regarding storage of Produce for long period, skills regarding mushroom spawn production and practice of mushroom cultivation, skills related to rearing of honey bee and extraction of honey, skills regarding efficient use and production of vermicompost, skills related to protected cultivation of planting materials and commercial flowers under green house, skills regarding postharvest management of fruits and vegetables, skill in cultivation of rose and Gladiolus.

The skill of the farmers regarding different programmes had been enhanced due to different training programmes under NHM. One of the main features of NHM is to educate farmers through vocational training programs. The methodology of education was organizational training. The respondents in general responded the training program conducted by the organizers in a very positive manner. The farming

community in general was satisfied on factors like periodicity, duration, personal conveniences, methodology and content of training. The participants were fully satisfied with the trainers because of their keen interest in imparting training with regard to training content.

The study further revealed that the farmers had undergone change not only in the knowledge but also in skill. So there was improvement in socio-economic condition of respondents. There is improvement in food habit, housing, clothing, children education, material possession. They had accounts in banks, post office, co-operative societies. Changing knowledge, attitude and skill through training was considered to be the major achievement of NHM.

Objective-3: Study of the socio-economic impact of NHM project through different interventions.

A. Socio-economic impact of NHM:

The objective deals with the training & its impact on skill of the beneficiary farmers. The nature and content of the training have been evaluated separately keeping in mind the basic concept behind the NHM activities & the principles of training. The magnitude of change in the skill of beneficiary farmers have been attempted to measure reaction of farmers on the nature of training.

I. Impact on living condition because of NHM interventions:

Table 6.3.1(Degree of improvement or deterioration of the respondents):

SI No	Classes	Percentage
1	Further deteriorated	0
2	Remains as before	10
3	Just improved	60
4	Improved very much	30

From the above table it can be inferred that 8 percent of the respondents told their condition remain as before. This may be due to the inactive participation in the training programme. 90 percent of respondents state their condition improved after becoming NHM beneficiary. Out of these 60 percent respondents told that their condition just improved after becoming NHM beneficiary and 30 percent had enhanced their income very much. It is due to their change in skill & knowledge about

the agricultural practices by attending the training programme .None of the respondents had stated that their condition has deteriorated after being enrolled in NHM activities.

II.Comparative study of average annual income:

Table 6.3.2(comparative study of average annual income):

SI No	Particulars	Before implementation of NHM	After implementation of NHM	Difference percentage	CR Value
1	<25,000/-	25	0	25	Significant
2	25,001/--50,000/-	50	35	15	Significant
3	50,001/--1 lakh	25	55	30	Significant
4	>1 lakh	0	10	10	

There was decrease in number of respondents having average annual income less than Rs.25,000 after became a NHM beneficiary. There was 30 percent decrease in number of respondents having average annual income from Rs.25,001 to Rs50,000. There was 120 percent increase in number of respondents having average annual income 50,001/- to 1 lakh. There was 10% increase in number of respondents of more than 1 lakh average annual income .This is due to their socio-economic development by NHM activities.

III. Reasons for increased income:

Table 6.3.3(reasons for increased income):

SI No	Items	Percentage
1	High yield from crop	60
2	Combination of crop cultivation and animal husbandry	15
3	Any other	25

It can be inferred from the table that 60 percent of respondents increased their income due to high yield from different crops. This is due to beneficiaries had got the timely & proper information about the plant protection, chemicals, proper fertilizer dose & improved technology assistance from NHM personnel. 15 percent of the beneficiaries increased their income through farming system activities by combining the activities like crop production and animal husbandry. 25 percent of the respondents

had increased their income through small enterprises like mushroom cultivation,vermicomposting,Honeybee rearing,etc.

IV. Improvement in socio-economic condition:

Table 6.3.4 (improvement in socio-economic condition):

SI No	Items	Percentage
1	Change in food habit	90
2	Housing	75
3	Clothing	70
4	Household amenities	60
5	Children education	85

After becoming NHM beneficiary,there is a great improvement in socio-economic condition.90 percent of beneficiary improved their food habit.75 percent of the beneficiaries improved their housing condition.70 percent of the beneficiaries improved their clothing style.60 percent of the beneficiaries improved in household amenities.85 percent of the beneficiaries improved their children education.

V. Types of residence:

Table 6.3.5(types of residence):

Items	Before NHM implementation	After NHM implementation	Difference percentage	CR Value
Kuchha	45	15	30	Significant
Semi pucca	35	50	15	Significant
Pucca	20	35	5	

From the table it is evident that before becoming NHM beneficiary 45 percent had kuchha residence while only 15 percent left after becoming NHM beneficiary.35 percent have semi pucca type residents before NHM which was increased to 50 percent after being NHM beneficiary.20 percent of the respondents had pucca type residence before NHM beneficiary which was increased to 35 percent after being NHM beneficiary.

VI. Material possession:

Table 6.3.6(Material possession):

SI No	Category	Before NHM implementation	After NHM implementation
1	Low	70	27.5
2	Medium	20	30
3	High	10	42.5

From the table it is evident that before becoming NHM beneficiary 70 percent have low material possession while only 27.5 percent left after becoming NHM beneficiary. 20 percent have medium material possession before NHM which is increased to 30 percent after being NHM beneficiary. 10 percent of the respondents have high material possession before NHM beneficiary which is increased to 42.5 percent after being NHM beneficiary.

VII. Livestock possession:

Table 6.3.7 (Livestock possession):

SI No	Category	Before NHM implementation	After NHM implementation
1	Low	50	17
2	Medium	40	70
3	High	10	13

From the table it is evident that before becoming NHM beneficiary 50 percent have low Livestock possession while only 17 percent left after becoming NHM beneficiary. 40 percent have medium Livestock possession before NHM which is increased to 70 percent after being NHM beneficiary. 10 percent of the respondents have high Livestock possession before NHM beneficiary which is increased to 13 percent after being NHM beneficiary.

VIII. Savings by beneficiaries:

Table 6.3.8(savings by the beneficiaries):

SI No	Items	Percentage
1	Bank	75
2	Post office	5
3	Purchase of land	5
4	Purchase of ornament	10
5	Co-operative society	30
6	Any other	5

The table reveals that most of the respondents had savings in bank, because banks provide different saving schemes for farmers and also provided different crop loan.30 percent of the respondents had savings in co-operative society.10 percent of the individuals saved their income by purchasing ornaments.5 percent beneficiaries had accounts in post office.5 percent beneficiaries purchased land to save their income.5 percent of beneficiaries saved their money in giving lend & earning interest like activities.

B. Assessment of effectiveness of NHM in improving socio-economic conditions of farmers:

The NHM was implemented in Dhenkanal district with an aim to uplift and elevate the social and economic status of farming community with the objectives like to increase in farm productivity,to increase in farm profitability, to create more employment opportunities and to promote capacity building.All the aforesaid objectives of NHM were directed towards developing the socio-economic condition of the farmers involved in the NHM.

To access the effectiveness of the project in improving the socio-economic condition of farmers,the responds of the respondents were recorded under seven aspects.Then under each aspect the statements were ranked as per the mean score obtained against them.The statement which obtained maximum mean score was ranked first that is maximum development took place for the statement and the statement which ranked last means minimum development took place for the statement and so on. The seven aspects under the study were technological development, economic development, social development, environmental factor,

cultural development, Development of Aspiration of the beneficiaries and skill enhancement aspect.

a. Technological development:

Technological development refers to the improvement in technological aspect related to farming which yield better result than before. It also includes other practices that bring about change in performances in day to day situations. Some important technological developments as responded by the beneficiaries are as follows.

Table 6.3.9(Technological development of the beneficiaries):

SI No	Aspect of technological development	Strongly agree	Agree	Undecided	Disagree	Strongest disagree	Mean score	Rank order
1	Increase in production and productivity	80	10	20	10	0	4.33	I
2	Better use of available resources	23	20	55	7	15	3.24	III
3	Better adoption of recommended technology	50	20	23	4	3	3.41	II
4	Sufficient demonstration to acquire skill management	20	10	50	15	25	2.87	IV

Average mean score=3.46

The aspects were having mean score greater than the average mean score i.e.3.46 were the important aspects of technological development.

Increase in production and productivity was ranked first followed by better adoption of recommended technology, sufficient demonstration to acquire skill Management, better use of available resource of adverse situation.

The technological development was possible due to increase in the technological knowledge of the farmers which resulted in increase in production and productivity. The beneficiaries have also developed a habit of better cultivation of available resources. The beneficiaries are technologically developed because of sufficient demonstration provided to them.

The statement management of adverse situation was ranked last because of the process of farming mainly depends on monsoon which is beyond the control of mankind. Again if drought situation prevails then also the farmers remain helpless. These conditions prevent the farmers from better management of adverse situation.

Economic development:

Economic development generally refers to the sustained concerted activities of communities that promote the standard of living and economic health of a specific area. It aims at social wellbeing of people. The beneficiaries ranked their responses according to the mean score obtained.

Table 6.3.10(economic development of the beneficiaries):

SI No	Aspects of economic development	Strongly agree	Agree	undecided	Disagree	Strongly disagree	Mean score	Rank order
1	Better marketing of produce	40	60	10	10	0	4.08	II
2	Improvement in overall living condition	70	30	10	10	0	4.33	I
3	Better access to credit	60	40	15	0	5	3.91	III
4	Increase in expenditure habit	50	20	20	15	10	3.58	IV
5	Increase in the saving	20	30	10	10	50	2.66	V

Average mean score=3.71

The economic aspects having mean score greater than average mean score i.e.3.71 were the important aspects of economic development.

This table clearly reflected the different parameters of economic development of farmers that was possible due to the implementation of NHM. The respondents ranked statements according to the economic development experienced by them.

A close look into the table intimated that the respondent beneficiaries ranked the statement Improvement in overall living condition as first followed by Better marketing of produce, Better access to credit, Increase in expenditure habit, Better repayment capacity.

The analysis of the above table revealed that the economic status of the beneficiaries had developed due to implementation of NHM project. This state of economic development was possible due to better marketing of the produce, increase in expenditure habits, more saving of the family and increase in material possession by the beneficiaries as compared to their past life.

All the above findings strongly advocates that the implementation of NHM project have surely made the farmers economically developed.

C. Social development:

Table 6.3.11(social development of the beneficiaries):

Sl. No.	Aspects of social development	Strongly agree	Agree	undecided	Disagree	Strongly disagree	Mean score	Rank order
1.	Good linkage established with official	23	20	55	7	15	3.24	V
2.	Improvement in health, education & entertainment	40	60	10	10	0	4.08	III
3.	Increase in respect for each other	50	20	20	15	10	3.58	IV
4.	Increase in decision making ability	80	10	10	10	10	4.16	II
5.	Increase in social status	70	30	10	10	0	4.33	I

Average mean score=3.87

The social aspects were having mean score greater than average mean score i.e. 3.87 were the important aspects of social development.

This table clearly reflected the different parameters of social development of farmers that was possible due to the implementation of NHM. The respondents ranked statements according to the social development experienced by them. The table intimated that the respondent beneficiaries ranked the statement Increase in social status as first followed by Increase in decision making ability, Improvement in health,

education & entertainment, Increase in respect for each other, Good linkage established with official.

D. Environmental factors:

Table 6.3.12(Environmental factors affects development of the beneficiaries):

Sl. No	Aspects of Environmental factors	Strongly agree	Agree	undecided	Disagree	Strongly disagree	Mean score	Rank order
1	Natural resource conserved	5	70	25	10	10	3.41	II
2	Degraded land are better used	10	80	20	7	3	3.73	I

Average mean score=3.57

The Environmental aspects were having mean score greater than average mean score i.e.3.57 was the important aspects of Environmental development.This table clearly reflected the different parameters of Environmental Factors development that was possible due to the implementation of NHM. The respondents ranked statements according to their experience.

A close look into the table intimated that the respondent beneficiaries ranked the statement degraded land are better used as first followed by natural resource conserved.From the above table it is revealed that the degraded land were mostly used by the farmers due to implication of NHM programme and natural resource were conserved and utilized by the beneficiaries perfectly

.E. Cultural development:

Table 6.3.13(cultural Developments of the beneficiaries):

Sl. No	Aspects of Cultural development	Strongly agree	Agree	undecided	Disagree	Strongly disagree	Mean score	Rank order
1.	Better co-ordinate among people	5	60	30	15	10	3.29	II
2.	Increase in the recreational facilities	4	74	28	10	4	3.53	I
3.	Increase in the dedication & religiousness	3	7	10	40	20	1.44	III

Average mean score=2.75

The cultural aspects were having mean score greater than average mean score i.e.2.75 were the important aspects of cultural development.

This table clearly reflected the different parameters of cultural development of farmers that was possible due to the implementation of NHM. The respondents ranked statements according to the cultural development experienced by them.

The table showed that the respondent beneficiaries ranked the statement Increase in the recreational facilities as first followed by Better co-ordinate among people, Increase in the dedication & religiousness.

The analysis of the above table revealed that the cultural status of the beneficiaries had developed due to implementation of NHM project. This state of cultural development was possible due to Better co-ordinate among people, Increase in the recreational facilities, Increase in the dedication & religiousness as compared to their past life.

F. Development of Aspiration of the beneficiaries:

Table 6.3.14(Developments of Aspiration of the beneficiaries):

Sl. No	Aspects of Aspiration	Strongly agree	Agree	undecided	Disagree	Strongly disagree	Mean score	Rank order
1.	Higher education for children	10	80	21	5	4	3.72	I
2.	Purchasing of land	2	70	3	35	10	3.15	IV
3.	Increase in possession	20	50	3	30	17	3.21	II
4.	Secondary occupation for increasing total income	6	48	32	28	6	3.16	III

Average mean score=3.31

The Aspiration aspects were having mean score greater than average mean score i.e.3.31 were the important aspects of aspiration development.

This table clearly reflected the different parameters of Aspiration development of farmers that was possible due to the implementation of NHM. The respondents ranked statements according to the Aspiration development experienced by them.

The above table intimated that the respondent beneficiaries ranked the statement higher education for childrens first followed by Increase in possession, Secondary occupation for increasing total income, Purchasing of land.

Due to implementation of NHM the income level of farmers were increased and that helped them to provide higher education to their children, to increase their possession help them in purchasing of land.

Objective-4: To study about the constraints faced by the farmers in operation of NHM programme.

Table 6.4.1 (Organization Constraints faced by Farmers):

SI No	Organisation Constraints	Strongly agree	Agree	undecided	Disagree	Strongly disagree	Mean score	Rank order
A	project personnel not fully involved	10	50	30	15	15	3.20	II
B	dominance of group leaders	5	40	30	25	20	2.87	III
C	lack of co-ordination and co-operation among related organisation	10	50	40	10	10	3.33	I

Average mean score=3.13

The constraints were having mean score higher than average mean score i.e.3.13 were the important constraints faced by the farmer.

Constraints faced by the farmer due to lack of co-ordination and co-operation in the organization was given first rank followed by less involvement of project personnel, dominance of group leaders.

Constraints in planning:-

Table 6.4.2(constraintsin planning faced by farmers):

SI No	Constrains in planning	Strongly agree	Agree	undecided	Disagree	Strongly disagree	Mean score	Rank order
A	not involving people in resource analysis	8	66	36	6	4	3.56	III
B	improper problem diagnosis	10	50	40	10	10	3.33	IV
C	planning not done from user perspective	15	75	25	10	5	3.95	I
D	no landless labours and tenant farmers were involved in the project	10	80	21	5	4	3.72	II

Average mean score=3.64

The constraints having mean score higher than average mean score i.e3.64 were the major constraints in planning faced by the farmer. Planning were not done from user perspectivewas the first constraint in planning for farmers followed by Lack of involvement oflandless labours and tenant farmers in the project, less involvement of people in resource analysis, improper problem diagnosis.

Constrains in programme implementation:

Table 6.4.3(constraintsin programme implementation):

SI No	Constrains in programme implementation	Strongly agree	Agr ee	undecided	Disagree	Strongly disagree	Mean score	Rank order
A	no flexibility in implementation	25	60	25	5	5	3.79	II
B	no transparency in implementation	20	30	50	10	10	3.33	III
C	no pre arrangement of inputs	10	60	30	12	8	3.93	I
D	insufficient demonstrations	30	20	15	50	5	3.16	IV

Average mean score= 3.55

The constraints having mean score higher than 3.55 were the important constraints in programme implementation.

Lack of pre arrangement of inputs was given first rank faced by the farmer followed by no flexibility in implementation, less transparency in implementation, insufficient demonstrations.

Constrains in funding:

Table 6.4.4(Constrains in funding faced by the beneficiaries):

SI No	Constrains in funding	Strongly agree	Agree	undecided	Disagree	Strongly disagree	Mean score	Rank order
A	insufficient funds to cover all activities	50	30	10	20	10	3.75	III
B	insufficient funds for training and other education activities	60	20	20	10	10	3.91	II
C	non availability of funds at the time of need	15	75	25	10	5	3.95	I

Average mean score=3.87

The constraints having mean score higher than 3.87 were the important constraints in funding faced by the farmer.

Lack of availability of funds at the mean time was ranked first followed by insufficient funds for training and other education activities, insufficient funds to cover all activities

Technological constrains:

Table 6.4.5(Technological Constrains faced by farmers):

SI No	Technological constrains	Strongly agree	Agree	undecided	Disagree	Strongly disagree	Mean score	Rank order
A	non availability of quality seed materials	50	20	20	15	10	3.58	II
B	non-involvement of scientists in demonstration process	3	80	25	8	4	3.45	IV
C	difficulty to handle some technology	2	66	44	4	4	3.48	III
D	Fear about adverse effect of technology	60	30	10	10	10	4	I

Average mean score=3.62

The constraints having mean score higher than 3.62 were the important technological constraints faced by the farmer.

Fear about adverse effect of technology was ranked first followed by lack of availability of quality seed materials, difficulty to handle some technology, less involvement of scientists in demonstration process.

Constraints in monitoring and evaluation:

Table 6.4.6(Constraints in monitoring and evaluation faced by farmers):

SI No	Constraints in monitoring and evaluation	Strongly agree	Agree	undecided	Disagree	Strongly disagree	Mean score	Rank order
A	lack of team spirit among the project persons	2	60	40	10	8	3.31	III
B	lack of sincerity and dedication	3	80	25	8	4	3.45	II
C	people not involved in evaluation process	2	66	44	4	4	3.48	I
D	feedback is not collected from all the beneficiaries in the evaluation process	8	33	50	20	9	3.09	IV

Average mean score=3.33

The constraints having mean score greater than average mean score 3.33 were the major constraints in monitoring and evaluation.

People not involved in evaluation process was given first rank followed by lack of sincerity and dedication, lack of team spirit among the project persons, feedback is not collected from all the beneficiaries in the evaluation process. **Objective-5: Elicitation of some case studies on different interventions.**

Case study-1: Mango cultivation under NHM:

Profile and status:

Shri Kalia Nayak aged 33 years is living in Analabareni village of Kamakhyanagar block. He is unmarried living with his mother. Six years before he was living with joint family. After his father's death the brothers divided among themselves. After division Kalia got 3 acre of land in his share. He found himself unemployment & faced difficulties in maintaining his family. Traditionally brothers

were growing paddy in this land. After division he also thought to start to grow paddy in this land. But due to distress sale of paddy he changed his idea.

Empowerment and assistance:

National Horticulture mission had started its work in every block of Dhenkanal in August 2007-08 and Kamakhyanagar was one of them. Initially Kalia was a late majority category of farmer. He saw the beneficiary farmers of National Horticulture mission were gaining profit by adopting different interventions of the mission. So he became a beneficiary by adopting Mango cultivation in his two acres of land in 2010 January. The Horticulture office in kamakhyanagar block provided him mango seedling to plant in his field. He was also assisted about mango cultivation and its diseases and control measure. He was also learnt about the application of fertilizer and pesticides through NHM training programmes. He was provided with different mango varieties like Amrapali, Baiganapalei and Mallika etc

Income Realization:

From the Mango cultivation he found 1200 kg of Mango. By this he earned Rs.50, 000 from Mango every year during Maintenance time and after 3 years of maintenance he got 1 lakh from his land. He made his pucca house. He says if he will work properly in the same piece of land then he will not require any engagement but he will give employment to others in his farm. Now Kalia is planning to increase the size of his mango farm .He can be categorized as early majority category of farmer now. He has interest in gaining knowledge about different programs of the Mission.

Case study-2: Gladiolus cultivation under NHM

Profile and status:

Mr. Charan Mallik aged 35 years is living in Mundideuli of Kamakhyanagar Block. Gundicha Malik, his father is a poor farmer. Mr. Charan has two sons and one daughter. Before one year his brothers divided their land among themselves. After division Charan got 2 acre of land in his share and started to grow paddy in the land. But due to distress sale of paddy he gradually became unable to feed his family twice a day. Moreover he had to take much pain to grow paddy in this one acre land. Being

helpless to maintain his family he became a beneficiary farmer of National Horticulture Mission in 2008. He said from that day he had never seen back but he got so many success in his life.

Empowerment and assistance:

Mr. Charan was advised to grow Gladiolus in his field. He grew gladiolus in 0.24 acre area along with rice in rest of the land. Irrigation is a major problem in these districts like Dhenkanal. So he was advised to make water harvesting structure from which irrigation can be easier and he would have no need to depend upon rain. He made one water harvesting structure of 1500 cubic meter capacity from which he was able to irrigate upto two hacter in kharif and upto one hacter in rabi season. Again in the first year he was provided with gladioli corms and the horticulture officer of Kamakhyanagar block demonstrated the gladioli cultivation to all the NHM beneficiaries interested to cultivate gladiolus. All assistant and knowledge about the maintenance of the plant was given by the AHO, Kamakhyanagar. He could successfully cultivate the gladiolus.

Income Realization:

He was getting Rs 25,000/- annually from rice. From gladiolus he was getting Rs.60,000 to 80,000/- annually.

Expressing his gratitude he says, “I was aimless when National Horticulture mission extended its help with their support and guidance. I learnt modern techniques of farming and got many valuable tips. My paddy production has increased and I have got good return from gladiolus cultivation too. Now people come to me seeking tips on paddy and gladiolus farming. ”

Case study-3: Vermicomposting under NHM

Profile and status:

Mr. NarendrakumarNaik is famous in Anlabareni village for vermicompost. His age is only 27 but counted in early majority category of farmers. But before this he was famous for his naughtiness. After completing plus two he was doing nothing and in

home spent his all time in playing cards. In 2008 when National Horticulture Mission is implemented in Anlabareni village of Kamakhyanagar block that time the Horticulturist of kamakhyanagar motivated the youth to do Vermicomposting under this project. It gave subsidies to farmer for establishing vermicompost unit. As Narendra's father Ratnakar became dead and the condition of his home became measurable, that time his all brothers started living with their family and left him alone. At this Mean time National Horticulture Mission extended his hands towards Narendra as adopter farmer in 2009.

Empowerment assistance:

First of all the project field staff suggested him for Vermicomposting. He was trained to gather knowledge on vermicomposting. Then he started his own Vermicompost unit. He was provide with all assistance about vermicomposting. How to prepare vermicompost unit, from where the earthworm is available, how to watering them, how to harvest them all information is provided by field staff of NHM project.

Income Realization:

He was consumed Rs.5, 000 on this Vermicompost unit and get Rs15, 000 within one months. He also provided vermicompost to the villagers and made his profit. He now want to increase the size of vermicompost unit. He had interest in gaining knowledge about different programs of the Mission.

Case study-4: Banana cultivation under NHM

Profile and status:

Mr. Purna Chandra Dehury was a school teacher of village Anlabareni of kamakhyanagar Block. He has two daughters and one son. His condition became measurable after his father's death. His father was a blood cancer patient. For his treatment he spent a lot of money .Those days teachers were also not getting salary regularly. Being helpless to maintain his family he became a beneficiary farmer of National Horticulture Mission in 2008.He said from that day he had never seen back but he got so many success in his life.

Empowerment assistance:

He was provided with seed, seedling, fertilizer pesticide and vermin worms for bio fertilizer. He was provided with Tissue culture banana and he purchased Champa variety of his own.

Income Realization:

He had planted 2000 suckers of Champa variety during 2008-09 and obtained the yield of 1992 bunches during first year and 1980 bunches as ratoon crop, which were sold at Rs. 40/- – Rs.85/- per bunch. The profit he earns from banana invested in vegetable cultivation and has extended his farming activity. He cultivated vegetable in 32 decimal area and earns around Rs. 40,000/- per annum. However he plans to develop a Mother Nursery of vegetable, fruits, potato, jhaon and eucalyptus in an area of 30cm×100cm in future.

SUMMARY AND CONCLUSION

Horticultural crops are grown over an area of 12 lakh hectares having potential up to 20 lakh hectares. The productivity particularly that of fruits, is quite low (5.93) as compared to national average (10.7) and much more less than world average. The main reason is the prevalence of old and senile orchards, lack of improved planting material of high yielding varieties/hybrids, inadequate post-harvest infrastructure and relative backward ness of the state farmers and tribal groups. The launching of National Horticulture Mission has come as an opportunity for the state to develop concentrated pockets of plantation, rejuvenation of old orchards and creation of post-harvest and marketing infrastructure and help in increasing the productivity capacity of the farmers. The study was conducted on the topic “The Impact of NHM On Socio-economic Development of farmers of Odisha.” With the following objectives:

- To study about the socioeconomic characteristics of farmers with specific reference to horticulture enterprise.
- To assess the knowledge and skill development of farmers after availing the benefits of NHM.
- To assess the effectiveness of NHM programme for improvement of socioeconomic condition of farmers.
- To study about the constraints faced by the farmers in operation of NHM programme.
- To present some case study on implication of NHM programme

One hundred twenty respondents were selected randomly from the 12 villages of four blocks namely Dhenkanal Sadar, hindol, kamakhyanagar, kankadahada block. An interview schedule was developed and information were collected through personal interview.

The summery and conclusion of the findings are presented below.

- i. According to age distribution the respondent farmers upto 30 years were 35 percent, between 30 to 50 years were 55 percent and above 50 years were 10 percent.

- ii. It was found that 30 percent of the beneficiaries were general, 50 percent were other backward category, 10 percent were belonging to SC category and only 10 percent were from ST category.
- iii. Most of the family were of joint family type that is 70 percent and 30 percent of beneficiaries were of nuclear family type.
- iv. According to family size the beneficiaries were divided into three categories. Beneficiary farmers family having five members were in small family category their percentage was 20 percent, family having five to eight members were in medium family category and their percentage was 50 percent and the farmer family members more than eight were in big family category and their percentage was 30 percent.
- v. 50 percent respondents were living in semipucca type of house, 35 percent of the respondents were in pucca type of house and 15% of the beneficiaries had kuchha dwelling.
- vi. According to education there were five categories of beneficiary farmers. Among them no one was illiterate, 10 percent of total sample population belonged to graduate. 45 percent of the beneficiaries had education upto secondary level. 20 percent of the sample respondents were having education upto primary level. 25 percent of the sample respondents were can read and write. There were no post graduate beneficiary among the sample respondents.
- vii. As regards to the size of operational holdings, it was found that there were no landless, 45 percent of the respondents have upto 1 acres of land, 30 percent have land between 1 acres to 2.5 acres. 25 percent farmers have 2.5 to 5 acres land. There were no sample respondent having more than 5 acre land.
- viii. As regards to annual family income, 35 percent of the sample respondents had annual income within 25,001 to 50,000. 55 percent of the sample respondents had annual income within 50,001 to 1 lakh. There were 10 percent sample respondents which having annual income upto 25,000 and 10 percent sample respondents which having annual income above 1 lakh.
- ix. According to cosmopolitaness 50 percent farmers were moderately cosmopolite, 20 percent were lesser cosmopolite and 30 percent of the farmers were highly cosmopolite.

- x. The study shows that 50 percent of the sample respondents had no social partnership. Out of other respondents 75 percent of the sample respondents had membership in 1 Organization, 25 percent of the sample respondents were having membership in more than 2 organization. There were no respondents which are office bearer
- xi. According to Extension Contact 30 percent farmers were linked with the extension agency frequently. 55 percent were linked occasionally and only 15 percent had no link with extension agency.
- xii. According to material possession of the farmers were categorized into three that is low, medium and high implement possessions. It was found that 42.5 percent beneficiaries possessed high level of type of material possession for farming. 27.5 percent of respondents belonged to low category that is they had lower level of material possession. There were 30 percent respondent belonged to medium category of material possession.
- xiii. According to livestock possession, 17 percent of the sample respondents were having low livestock possession, 70 percent were having medium level of Livestock possession and 13 percent of the sample respondents were having high livestock possession.
- xiv. 75 percent had their savings in bank. 30 percent of the respondents had savings in co-operative society. 10 percent of the individuals saved their income by purchasing ornaments. 5 percent beneficiaries had accounts in post office. 5 percent beneficiaries purchased land to save their income. 5 percent of beneficiaries saved their money in giving lend & earning interest like activities.
- xv. The beneficiaries prioritized the aspects of purpose of involvement in the NHM in the following order i.e. to get economic benefit, to get higher production to get services of the specialists, gathering upto date knowledge, social development, skill enhancement, since they had been chosen to become the beneficiary, to be identified in the society.
- xvi. The beneficiaries prioritized the knowledge of beneficiaries towards objectives and activities of NHM in the following order i.e. different programme of the project, area of operation, Name of the field staffs of the project, Location of

its headquarters, Meaning of NHM, Usefulness and effectiveness of the project, Name of the executive staffs of the project, Year of initiation of the project, Location of implementing agency.

- xvii. The knowledge level of the beneficiaries increased more in plantation of fruit crops, integrated nutrient management, post-harvest of fruits, organic farming.
- xviii. To access the enhancement of skills of farmers the beneficiary farmers prioritized organic farming first followed by plantation of fruit crops. They gave last preference to cultivation of rose and gladiolus and.
- xix. The beneficiaries prioritized the technological development in the following order i.e. Increase in production and productivity, better adoption of recommended technology, sufficient demonstration to acquire skill Management, better use of available resource of adverse situation.
- xx. The beneficiaries prioritized the economic development in the following order i.e. the statement Improvement in overall living condition, better marketing of produce, Better access to credit, Increase in expenditure habit, Better repayment capacity.
- xxi. The beneficiaries prioritized the social development in the following order i.e. Increase in social status, Increase in decision making ability, Improvement in health, education & entertainment, Increase in respect for each other, Good linkage established with official.
- xxii. The beneficiaries prioritized the economic development in the following order i.e. degraded land are better used, natural resource conserved.
- xxiii. The beneficiaries prioritized the cultural development in the following order i.e. Increase in the recreational facilities, Better co-ordinate among people, Increase in the dedication & religiousness.
- xxiv. The beneficiaries prioritized the development of aspiration in the following order i.e. higher education for children, Increase in possession, Secondary occupation for increasing total income, Purchasing of land.
- xxv. From the case studies it can be revealed that the beneficiaries have nearly tripled their income level and are living a smooth life.

- xxvi. The beneficiaries prioritized the organization Constraints in the following order i.e. Constraints faced by the farmer due to lack of co-ordination and co-operation in the organization, less involvement of project personnel, dominance of group leaders.
- xxvii. The beneficiaries prioritized the Constraints in planning in the following order i.e. planning were not done from user perspective, Lack of involvement of landless labours and tenant farmers in the project, less involvement of people in resource analysis, improper problem diagnosis.
- xxviii. The beneficiaries prioritized the Constraints in programme implementation in the following order i.e. lack of pre arrangement of inputs, no flexibility in implementation, less transparency in implementation, insufficient demonstrations.
- xxix. The beneficiaries prioritized the Constraints in funding in the following order i.e. lack of availability of funds at the meantime, insufficient funds for training and other education activities, insufficient funds to cover all activities
- xxx. The beneficiaries prioritized technological Constraints in the following order i.e. lack of availability of quality seed materials, difficulty to handle some technology, less involvement of scientists in demonstration process.
- xxxi. The beneficiaries prioritized Constraints in monitoring and evaluation in the following order i.e. people not involved in evaluation process, lack of sincerity and dedication, lack of team spirit among the project persons, feedback is not collected from all the beneficiaries in the evaluation process.

Impact of National Horticulture Mission (NHM) on Socio-economic Development of Farmers of Odisha is an important contribution which provides an indepth knowledge about the rural livelihood and their socio-economic condition.

In this study inadequate time period of the project staff and fear about adverse effect of technology are observed as important lapses in effective implementation of the programme. The stakeholders should be given full autonomy at planning and implementation of all the interventions. Strong marketing network should be developed, so that the beneficiaries can get appropriate support price for their products.

With change of time and situation, the age old rural life interlinked with belief, value, norm and attitude of rural people are set to change. Rural people are sensitized to change their practices, but need a thrust to come over barriers. There is need of identification and documentation of appropriate rural enterprises for inclusion in socio-economic development programmes. Involvement of non-Government agencies like women SHGs, Farmers Interest Groups will help to achieve the objectives to a great extent.

The findings of this investigation can help the planners and top executives working for upliftment of rural mass. The scholars and research workers in the field of behavioural science deserve possible help and guidance in designing their research studies for finding the impact of National Horticulture Mission.

BIBILIOGRPHY

- Ahemd, M.S. (1992). Attitude and adoption behavior of farmers towards the recommended agricultural practices of NWPDPR in Cuddapah district of Andhrapradesh. Unpub. MSc (Ag) thesis, OUAT, Bhubaneswar.
- Ahemd, S. and Ahemd, J. (1994)An impact study of the Mangala watershed management project.
- Ahire, R. D., Lambat, A. H., Kalaskar, A.P., Choudury, A. A & Bansal, R.S (2002): Adoption of cotton cultivation practices in Umari watershed development project, Journal of soil and crops, 2002, 12:1, pp62-65.
- AkhileshkumarDubey and J. P. Srivastava (2007). Effect of training programme on knowledge & adoption behaviour of farmers on wheat production technologies Indian Research Journal extension education 7 (2&3), May & September 2007.
- Anandraj Kumar, P.(1995). Voluntary organization in rural development.
- Anchule, M.M, (2000), critical analysis of technological gap in use of pulse production technology, ph.d. Thesis, MAU, Parabhani (M.S).
- Arora, M. (2003).Integrated watershed development (Hill-II) project, employment news, pp12-18 April 2003
- Ayoade, A.R; Ogunwale, A.B; Adewale, J.G (2011) Impact of national special programme for food security on poverty alleviation among women in Oyo State, Nigeria.International-Journal-of-Agriculture-Environment-and Biotechnology. 2011; 4(2): pp- 139-151
- Ayoola,J.B; Dangbegnon,C; Daudu,C.K; Mando,A; Kudi,T.M; Amapu,I.Y; Adeosun,J.O; Ezui,K.S (2011) Socio-economic factors influencing rice production among male and female farmers in Northern Guinea Savanna Nigeria: lessons for promoting gender equity in action research.

Agriculture-and-Biology-Journal-of-North-America. 2011; 2(6): pp-1010-1014

Banger, S. and Sthool, G. 2004. "Impact of watershed programme on pomegranate, Jofarmers of Maharastra," Indian Journal of Extension education, xxxix (1&2):32.

ChaitanyaKumari (1995) (1) PP 78-83 Manjulata, M.N (1991). Book Review of social walefare administration Sept-Oct (1990)

Choudhary,S.K. Doctoral Fellow (2013)- ICSSR, New Delhi International Journal of Advanced Research in Management and Social Sciences ISSN: 2278-6236 Vol. 2 No. 6 June

Dash (2001). A study on role of NGOs in Agriculture development, MSc (Ag);Thesis college of Agriculture,OUAT, Bhubaneswar

Dreze, J. (1990). "Poverty in India and IRDP DELUSION". Economic &political weekly, 25 (39): pp95-104.

Eswarappa, K. (2009). Role of NGO iN the development of Sugalis:A case study of settlement in Andhra Pradesh, Journal of Human ecology, 27(2); pp115-122

GodaraA.K., kumarPradeep,Mehta S. K. & SinghNasib (2009) correlates of constraints of extension scientistsaffectingthe productivity. Indian Journal Agricultural Research, 43(1): pp42-46, 2009

Gogoi, M.E., Phukan and R.K., Talukdar(2000), Impact of farmers training programme on adoption of rice production technology by farmers. Maharashtra journal Extension Education, 19: pp232-238

Gupta, S.P. &Rathore, N.S. (1998). Marketing of vegetables in Raipur district of Chhatisgarh state. An economic analysis. Indian Journal of Agricultural economics. 3b (3).

- Hanumanthaiah, C. V and Sunbabsiva Rao Pokuri (2003). Temporal variations under pre and post watershed management programme; The Andhra Agricultural Journal 50 (3&4): pp332-336
- J.S. Binkadakatti, S. N. Hanchinal and BasavrajPawar (2011). Impact of KVK training programme on personal, socio-economic status and knowledge level of pigeonpea farmers in Gulbarga district, Agriculture update |vol.6|Issue 1|February, 2011
- James, K.S. (1995). Demographic transition & education in Kerla. Economics & political weekly. 30 (51):pp3274-3276.
- Jha, P. N. and Shaktawat, G. S., (1972), Adoption behavior of farmers towards hybrid Bajra cultivation, Indian Journal of Extension Education.8: pp23-41
- Kadam, R.R, (1991). Role performance of contact farmers in training & visit system. Maharastra Journal of Extension Education, 12(2):pp164-168.
- Kanwi,V.p., (2000), study on knowledge and adoption behavior of sugarcane growers in Belgaum district of Karnataka. M.Sc (Ag) thesis. University of Agricultural sciences, Dharwad
- Karamjit Sharma, S. P. Singh and V. P. S Yadav, (2009). Knowledge of dairy farmers about improved buffalo husbandry management practices Indian Research Journal extension education 9 (3), September, 2009.
- Kassem, H.S (2014) Effectiveness of Different Agricultural Extension Methods in Providing Knowledge and Skills in Disease Prevention: A Case of Smallholder Poultry Production Systems in Dakhalia Governorate of Egypt. Asian journal of Extension Education, Economics & sociology, ISSN: 2320-7027, 2(3) March-April, pp- 91-107
- Kgosiemang, D.T; Oladele, O.I (2012) Factors affecting farmers' participation in agricultural projects in Mkhondo Municipality of Mpumalanga Province, South Africa. Journal-of-Human-Ecology. 2012; 37(1): pp- 19-27

- Lanjewar, R.R., Gohad, V.V., Veer, M.D. and Barse, K.N. (2011). Impact of National Horticulture Mission on beneficiaries, *Adv. Res. J. Soc. Sci.*, 2 (2): pp 178-180.
- Madhavareddy, K. V. (2001). People's participation in watershed development programme implemented by Govt. & Non Governmental organization A comparative analysis .M.Sc (Ag) Thesis, UAS, Dharwad, Karnataka, India
- Malena, C. (1995) "A partial guide to operational collaboration between World Bank and non-governmental organization", World Bank, organizational problems of NGOs, the journal of Turkish weekly.
- Mishra, D.K., Paliwal, D.K.; Tailor, R.S and Deshwal, A.K. (2009). Impact of front line demonstrations on yield enhancement of potato Indian Research journal Extension Education. 9(3), September, 2009.
- Mohanty, D. (1997). Role of NGOs in the implementation of Agricultural programmes to bring socio-economic upliftment of rural of rural people .M.Sc (Ag) Thesis, OUAT, Bhubaneswar.
- Moore M. & Stewart, S. (1998) corporate governance of NGOs. Development in practice volume 8, Number 3, oraganizational problems of NGOs, The Journal of Turkish weekly."
- Muhammad, Israr (2010) Determinants of Rural Household Income for Livelihood in Northern-pakistan. PhD thesis, NWFP Agriculture University, Peshawar.
- Munir Hussain Naik 1, S. R. Srivastava 2, A. K Godara 3 & V .P .S Yadav 4, (2009), knowledge level about organic farming in Haryana Indian Research Journal Extension education 9 (1) , January 2009
- Nagabhushanil (2001) people's participation in watershed development, Abstract volume of National symposium on developmental communication in rural sector, 2001, Pallisikha Bhawan; Viswa Bharati: PP37

- Nagaraja, M.V, (2002), A study on knowledge of improved cultivation practices of sugarcane and their extent of adoption by farmers in Bhadra command area in Davanagere district, Karnataka state Ph. D. Thesis, University of Agricultural sciences, Dharwad.
- Nanda, S. K. (2004). "Status of microlevel planning in India" *Journal of Rural Development*. (4) (6) pp 841-915
- Nirmala, B. (2003). Impact of watershed development programme on socio-economic dimensions of beneficiaries in Rangareddy district of Andhra Pradesh.
- Olajide, B.R (2011) Assessment of farmers' access to agricultural information on selected food crops in Iddo District of Oyo State, Nigeria. *Journal-of-Agricultural-and-Food-Information*.2011; 12(3/4): pp- 354-363
- Patel, M. (2009), regional partners & stakeholders, National seminar on vision convergence & action.
- Patil, P. S (2000). A study on adoption of banana production technology under drip irrigation, M.Sc (Agriculture) thesis, MAU, Parbhani (M. S)
- Pattnaik, B. (1999), A study on rural poverty, *Indian journal of extension education*, xxviii (1&2):32
- Puthiraprathap, O. L., Santhagovind and Vasantha Kumar, J., (1999), profile characteristics and overall participation of members of credit management groups. *Maharashtra journal of Extension Education*, 10(2): pp2451-2454
- Raghunandan, H. C., (2004), A study on knowledge and adoption level of soil and water conservation practices by farmers in Northern Karnataka, M.Sc (Ag) thesis, University of Agricultural sciences, Dharwad
- Rao, T. (1996). "Role of co-operatives in development of landless labours" in *Andhra Pradesh, Kurukshetra*, XLXII (5)

- Reddy, A. V. S & Purushottam, P. (2002), rural technologies for poverty alleviation, Kurukshetra, Nov 2002: pp 22-27
- Sagar, M.p. (2001), slow pace of mushroom cultivation problems and suggestions. Agricultural Extension Review, 13(1): pp27-31
- Sanjeev Kumar, Birendra Kumar, S. Hindustani and Gopal Sankhala, (2011), knowledge level of Dairy farmers in operational area of Krishi Vigyan Kendra about Improved dairy farming practices Research journal of Agricultural sciences 2011, 2(1): pp122-124
- Sashidhar, D. N, (2004), A study on influencing factors and constraints in drip irrigation by Horticulture farmers of Bijapur district of Karnataka. M.Sc (Ag) thesis, University of Agricultural sciences, Dharwad
- Shiv Kumar, N. (2009), impact Assessment of Agriculture interaction in tribal areas in Madhya Pradesh final report catalyst management services, Bhopal, pp 41-43
- Siddique, S. S. H & Pathak, M. (1991), Role of women in paddy cultivation. Indian farmer times 9 (4): pp 19-20
- Singh Dan, S. P. Singh R. P Singh and V. K. Sharma (2011) Impact on perceived characteristics and adoption behaviour of KVK trained trainees in relation to food grain crop production technology programme Agriculture. 11 (1): pp187-189
- Singh, K. J. (2004). A comparative study of Punjab & Haryana. Journal of Rural Development, 2 (1) pp 69-74
- Sithalaxmi, Y. (1995). "Impact of SHG on income of farm women" in Tamil Nadu, NABARD, Mumbai.
- Suresh, (2004), Entrepreneurial behavior of milk producers in Chittoor district of Andhra Pradesh-A critical study. M. V. Sc. Thesis, Acharya N.G. Ranga Agricultural University, Hyderabad

- Thore, V.V. Deshmukh P.R. AND Bhosale P.B. (2009) Department of Extension Education, College of Agriculture, Marathwada Agricultural University, PARBHANI (M.S.), INDIA Agriculture Update, Vol. 4, Issue 3 & 4, August & November 2009, pp 270-272
- Tripathy, B.(2002). A Study on the impact of KVK among farming communities of Kendrapara district of Odisha, MSc (Ag) Thesis, OUAT, Bhubaneswar
- V. P. S. Yadav R. S. Raman and R. Kumar (2006). Knowledge and attitude of farmers towards soil testing practices Indian Research Journal of Extension Education 6(3), September 2006

Questionnaire

Impact of National Horticulture Mission (NHM) on Socio-economic Development of Farmers of Odisha

Name of the respondent :

Village :

Gram Panchayat:

Block :

District :

Date of interview :

Socio-economic profile of the respondents:-

Age: a) up to 30-

b) 31 to 50-

c) Above 50-

Caste:

a) SC

b) ST

c) OBC

d) General

Family Size:

a) Small(up to 5)-

b) Medium (6-8)-

c) Big(>8)-

Family type:

a) Nuclear-

b) Joint-

Type of house:

- a) Kucha-
- b) Semi pucca-
- c) Pucca-

Level of Education:

- a) Illiterate-
- b) Can read & write only-
- c) Up to Primary level-
- d) Up to Secondary level-
- e) Graduate-
- f) Post-graduate& above

Land holding

- a) land less –
- b) up to 1 acres
- c) 1 to 2.5 acres-
- d) 2.5 to 5 acres-
- e) More than 5 acres-

Annul income-(present)

- a) Below Rs 25,000/-
- b) Rs 25,001- Rs 50,000
- c) Rs50, 001- 1 lac
- d) Above 1 lac

Cosmopoliteness:

- i) How frequently do you visit to the nearest town?

Frequently	occasionally	Never

Social participation

Are you related to any formal organization? Yes/No

If yes:

- a) Member of one organization
- b) Membership in more than one organization

c) Office bearer

Exposure to extension agencies: - 1) Frequently 2) Occasionally 3) Never

- 1) Village level
- 2) Block level
- 3) District level
- 4) State level

Material possession:

- 1) House
- 2) Cycle
- 3) Motor cycle
- 4) Radio
- 5) Television

Livestock possession:-

- 1) Bullock
- 2) Cows
- 3) Goats
- 4) Poultry birds

OBJECTIVE-2

I) To assess the knowledge development of beneficiaries regarding objectives and activities of NHM.

a. Knowledge of beneficiaries regarding objectives and activities of NHM.

Sl No.	Item	Do not know	Know to some extent	Know well
a.	Meaning of NHM			
b.	Year of initiation of NHM			
c.	Objectives of NHM			
d.	Area of operation			
e.	Location of its implementing agency			
f.	Location of its headquarter			
g.	Name of the field staffs of the project			
h.	Name of the executive staffs of the project			
i.	Different programs of the project			
j.	Usefulness and effectiveness of the project			

b. Purpose of your involvement in the NHM Program

Sl No.	Item	Responds		
		Strongly Agree	Agree	Disagree
a.	Economic benefit			
b.	Social development			
c.	To get higher production			
d.	Skill enhancement			
e.	Gathering up to date knowledge			
f.	To get the services of specialists			
g.	To be identified in the society			
h.	Since I have been chosen to become the beneficiary			

c. Perception of the beneficiaries towards NHM project.

Sl No.	Item	Responds		
		Strongly agree	Agree	Disagree
a.	NHM is a good technology transfer unit for development of farming community			
b.	The project deals with most important problems of the farming community			
c.	Beneficiaries get necessary help as per the objectives			
	Activities			
d.	Farmers friendly and feasible for resource poor farmers			
e.	The project has brought over a remarkable change over the living standard of the beneficiaries			
f.	The training program of the project are as per the needs of the beneficiaries			
g.	The project activities have brought change of non-beneficiaries			

2) To assess the knowledge development offarmers after availing NHM:-

Do you feel that your knowledge have been increased on:-

1. Knowledge on nursery preparation –

Sl.No.	item	SA	A	U	D	SD
1.	Soli preparation in nursery.					
2.	Nursery bed preparation					
3.	Leveling of the nursery					
4.	Irrigation channel preparation in nursery					

2. Plantation of fruit crops-

1.	Land preparation					
2.	Patten of planting of fruits crop					
3.	Use of Drip irrigation in plantation area					

3. Post-harvest of fruits and vegetables

1.	Sorting and grading of fruit and vegetables					
2.	Value addition to fruit and vegetables					
3.	Packaging of the products					
4.	Marketing of the value added product					

5. Protected cultivation and green house cultivation-

1.	Green house preparation					
2.	Mulching in green house					
3.	Maintain temperature and humidity in green house					

6. Organic farming

1.	Principle of Organic farming					
2.	Use of biological methods for controlling pests					
3.	Use of Azolla and BGA					

7. Rearing of honey bee-

1.	Establishment of hives					
2.	Proper rearing of queen					

8. Vermicomposting

1.	Waste material used for vermicomposting					
2.	Different types of vermicomposting					
3.	Maintaining the ratio of earthworm and compost in tank					
4.	Harvesting of compost					

9. Mushroom cultivation

1.	Preparation of spawn					
2.	Preparation of bed for mushroom cultivation					
3.	watering in mushroom bed					
4.	Harvesting of mushroom					
5.	Marketing of mushroom					

10. Integrated nutrient management -

1.	Concept of integrated nutrient management					
2.	right proportion of nutrient					

3)To assess the skill development of beneficiaries after availing the benefits of NHM

SL No.	STATEMENT	SA	A	U	D	SD
1.	Improvement in skills regarding nursery preparation.					
2.	Improvement in skills plantation of fruit crops.					
3.	Improvement in skills regarding postharvest management of fruits and vegetables.					
4.	Improvement in the skill in cultivation of rose and Gladiolus.					
5.	Improvement in skills related to protected cultivation of planting materials and commercial flowers under green house					
6.	Increase in skills regarding organic farming					
7.	Improvement in skill regarding storage of produce for long period.					
8.	Increase in skills regarding creation of water resources through plastic lining.					
9.	Improvement in skills in maintainace of fruit crops					
10.	Improvement in skills related to rearing of honey bee and extraction of honey.					
11.	Improvement in skills regarding mushroom spawn production and practice of mushroom cultivation.					
12.	Improvement in skills regarding use of farm implements.					
13.	Improvement in skills regarding efficient use and production of vermicompost					
14.	Increase in skills in integrated nutrient management in fruit crops.					
15.	Increase in skills regarding handling and marketing of fruit, cut flower and loose flower.					

OBJECTIVE-3

A.To study the socio-economic impact of NHM through different interventions.

I.Do you feel that your living condition has improved because of NHMinterventions?

Please put a tick mark.

a.Yes

b.No

If Yes, whether

a.Improved very much.

b.Just improved.

If no,whether

a.Remained as before.

b.Furtherdeterioted.

II. What was your average annual income?

Before

a) Below Rs 25,000/-

b) Rs 25,001- Rs 50,000

c) Rs50,001- 1 lac

d) Above 1 lac

III. Reasons for increase in income.

a.High yield from crops

b.Combination of crop cultivation and animal husbandry

c.Any other

IV.In which area you feel there has been improvement.

a.Change in food habbit

b.Housing

c.clothing

d.House hold amenities

e.Children education

V.Type of residence.

Before:-a)Kachha

b) Semi pucca

c) Pucca

VI.Material possession

Before:-

1) House

2) Cycle

3) Motor cycle

4) Radio

5) Television

VII. Have you saved in any way?

Yes

No

If Yes, in which way.

a. Bank

b. Post office

c. Purchase of land

d. Purchase of ornaments

e. Co-operative society

f. Any other

B. To assess the effectiveness of NHM in improving the socio-economic condition of the beneficiaries.

SL. No.	ASPECTS OF DEVELOPMENT	SA	A	U	D	SD
1.	Technological development					
a)	Increase in production and productivity					
b)	Better use of available resources					
c)	Better adoption of recommended technology					
d)	Sufficient demonstration to acquire skill					
2.	Economic development					
a)	Better marketing of produce					
b)	Improvement in overall living condition					
c)	Better access to credit					
d)	Increase in expenditure habit					
e)	Increase in the saving					
3.	Social development					
a)	Good linkage established with official					
b)	Improvement in health, education & entertainment					
c)	Increase in respect for each other					
d)	Increase in decision making ability					
e)	Increase in social status					
4.	Environmental factor					
a)	Natural resource conserved					
b)	Degraded land are better used					
5.	Cultural development					
a)	Better co-ordinate among people					
b)	Increase in the recreational facilities					
c)	Increase in the dedication & religiousness					

6.	Development of Aspiration of the beneficiaries					
a)	Higher education for children					
b)	Purchasing of land					
c)	Increase in possession					
d)	Secondary occupation for increasing total income					

OBJECTIVE-4

To study about the constraints faced by the beneficiaries in operational implication of NHM program.

SL No.	CONSTRAINT	SA	A	U	D	SD
1.	Organisation Constraints					
	a) project personnel not fully involved					
	b) dominance of group leaders					
	c) lack of co-ordination and co-operation among related organisation					
2.	Constrains in planning					
	a) not involving people in resource analysis					
	b) improper problem diagnosis					
	c) planning not done from user perspective					
	d) no landless labours and tenant farmers were involved in the project					
3.	Constrains in programme implementation					
	a) no flexibility in implementation					
	b) no transparency in implementation					
	c) no pre arrangement of inputs					
	d) insufficient demonstrations					
4.	Constrains in funding					
	a) insufficient funds to cover all activities					
	b) insufficient funds for training and other education activities					
	c) non availability of funds at the time of need					
5.	Technological constrains					

	a) non availability of quality seed materials					
	b) non-involvement of scientists in demonstration process					
	c) difficulty to handle some technology					
	d) Fear about adverse effect of technology					
6.	Constrains in monitoring and evaluation					
	a) lack of team spirit among the project persons					
	b) lack of sincerity and dedication					
	c) people not involved in evaluation process					
	d) feedback is not collected from all the beneficiaries in the evaluation process					

Figure 6.1.2(caste distribution of the respondents):

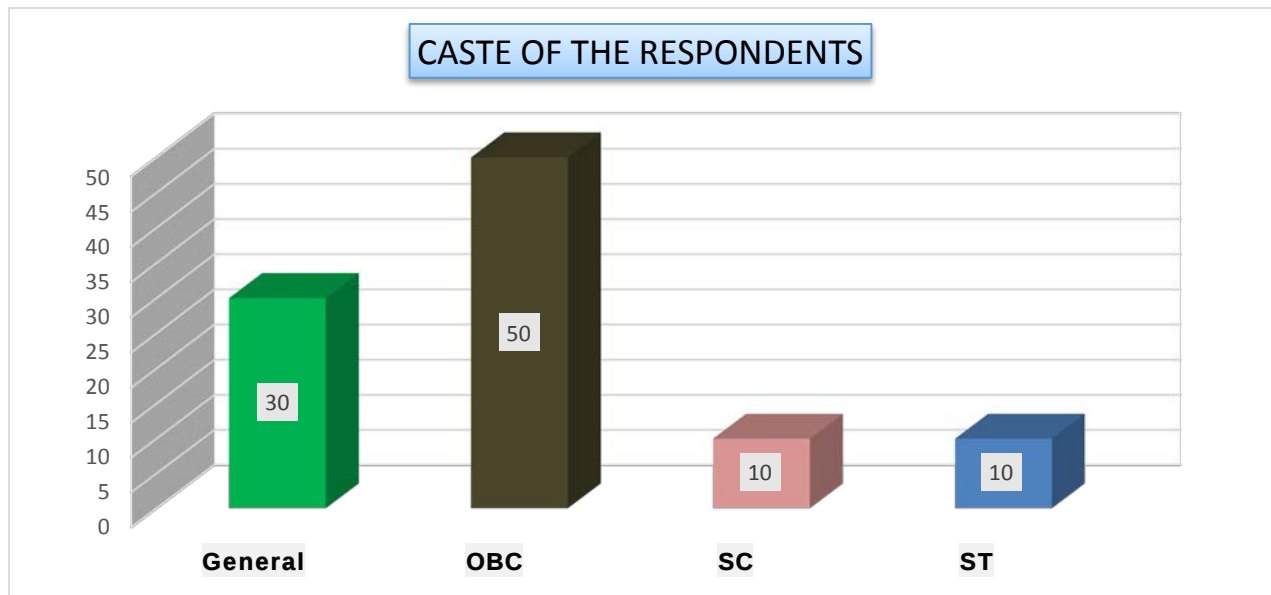


Figure- 6.1.3(family type of the respondents)

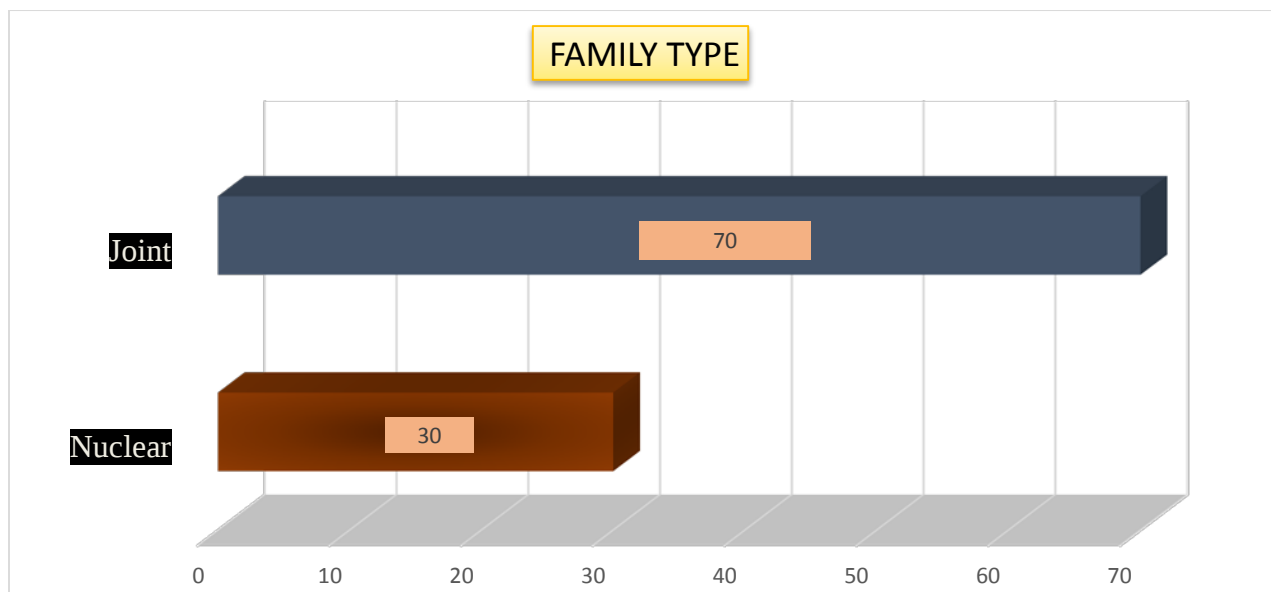


Figure- 6.1.4 (Distribution of beneficiaries according to family size):

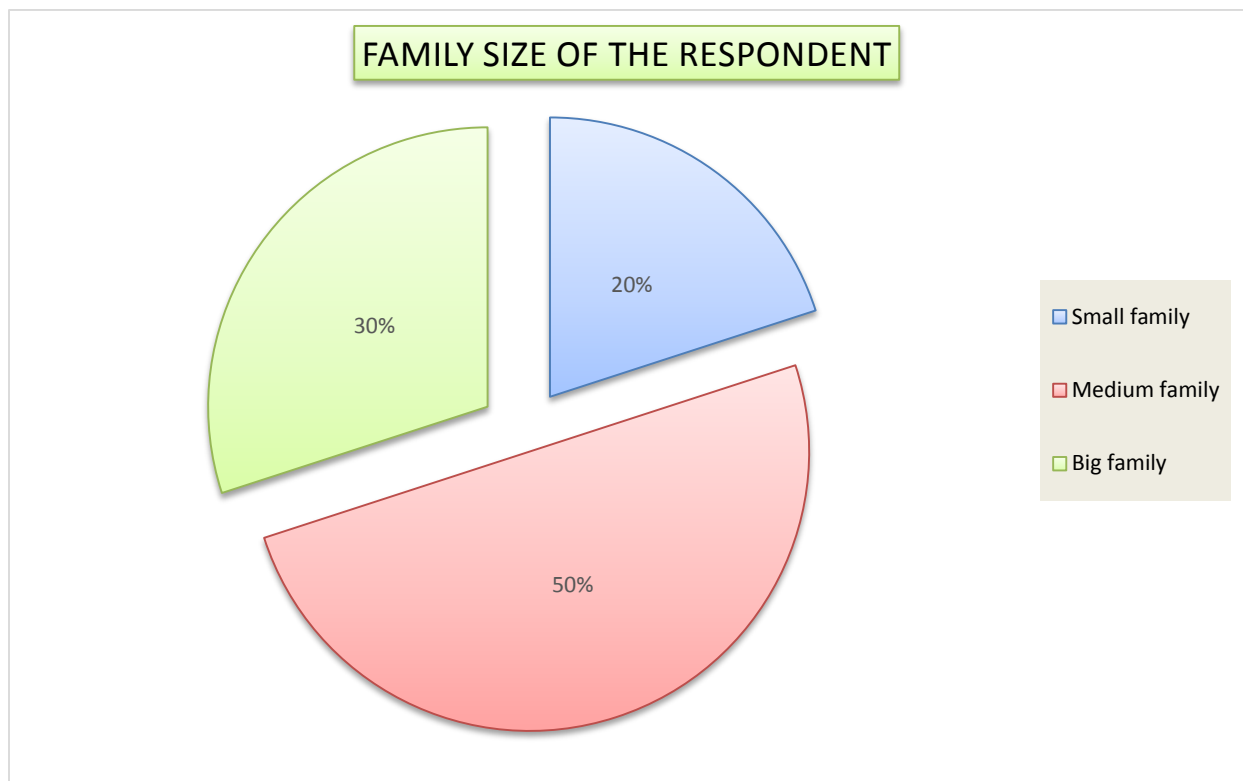


Figure-6.1.5 (Distribution of respondents according to house type):

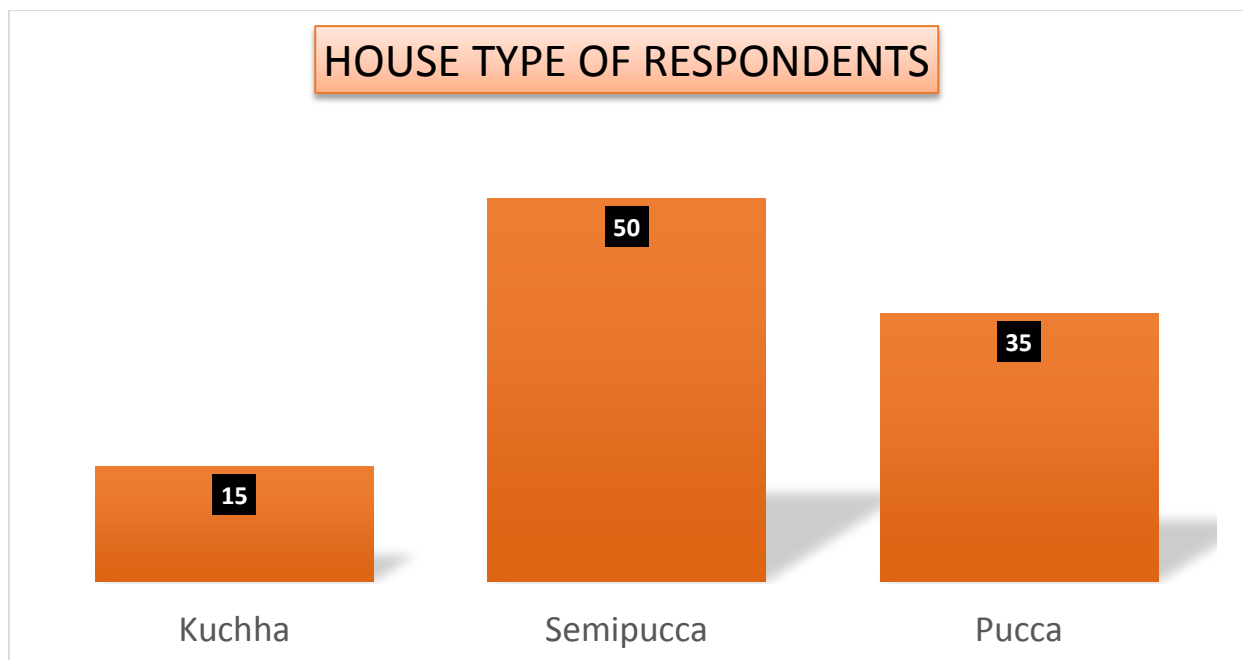


Figure-6.1.6 (distribution of Educational standard of the respondents)

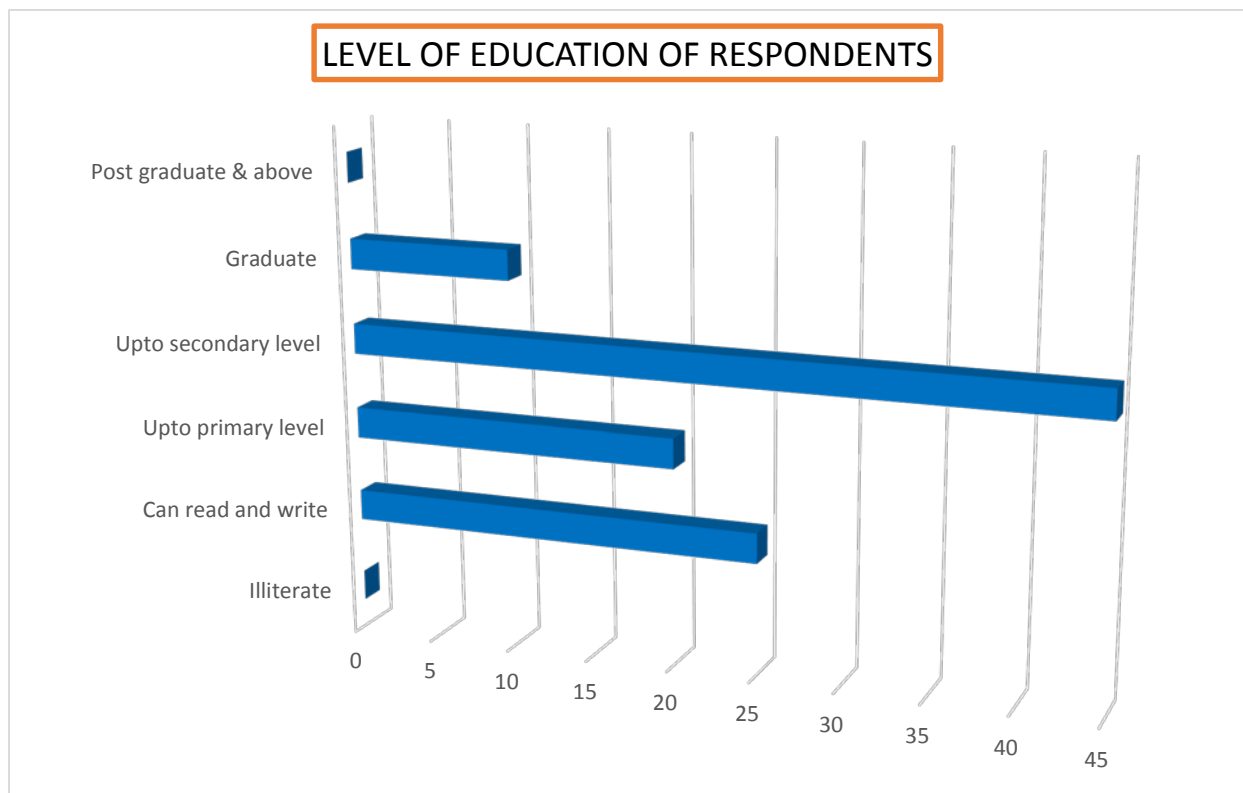


Figure- 6.1.7(Size of holding of the respondents):

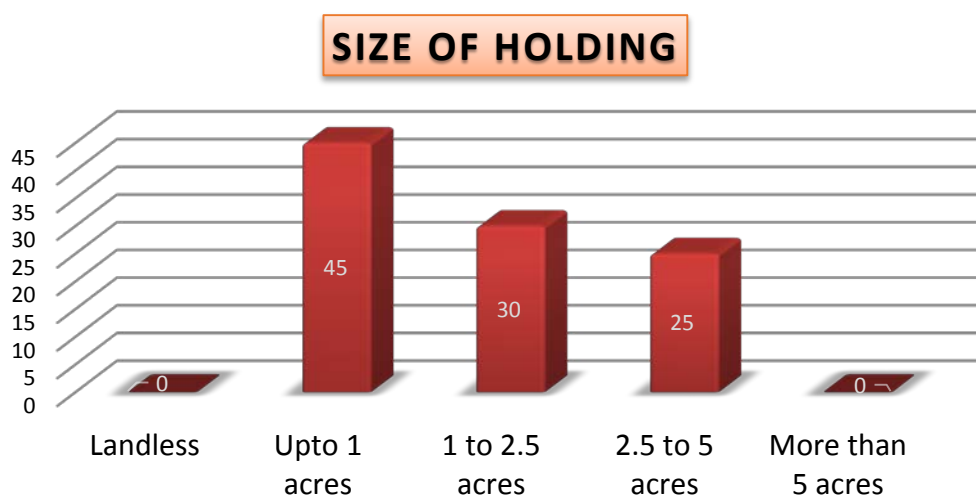


Figure-6.1.9(Cosmopoliteness of the beneficiaries)

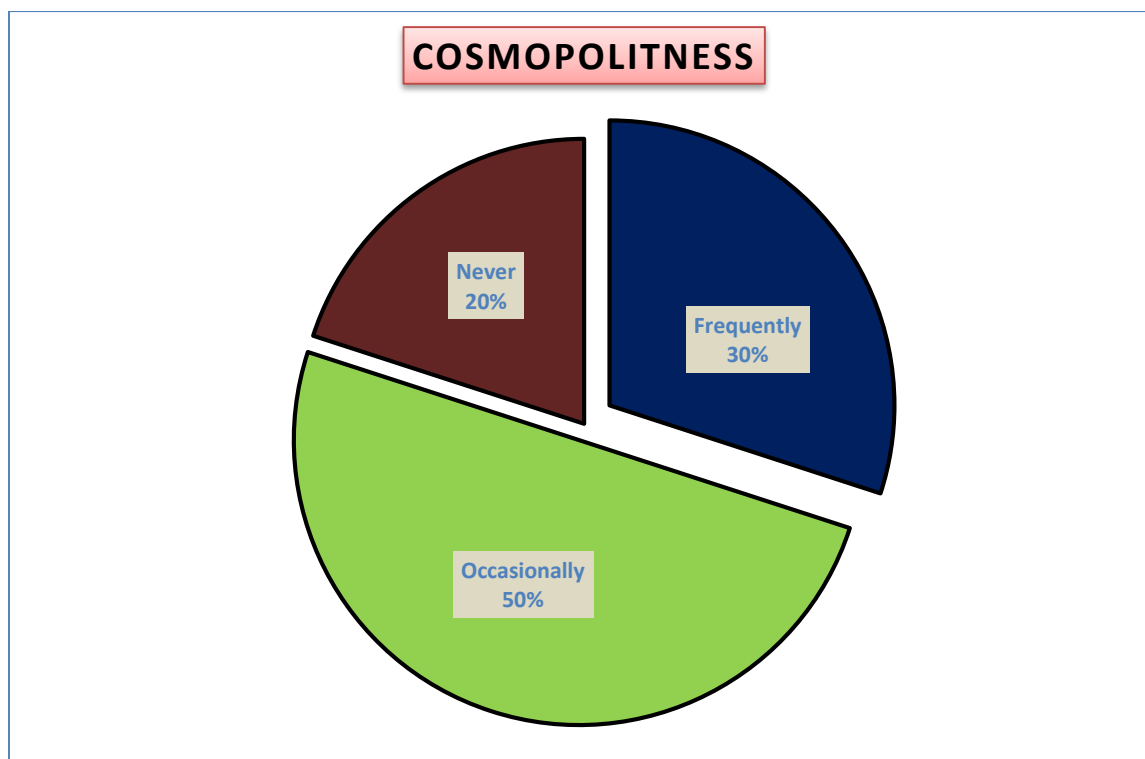


Figure-6.1.10(Social participation of the respondents)

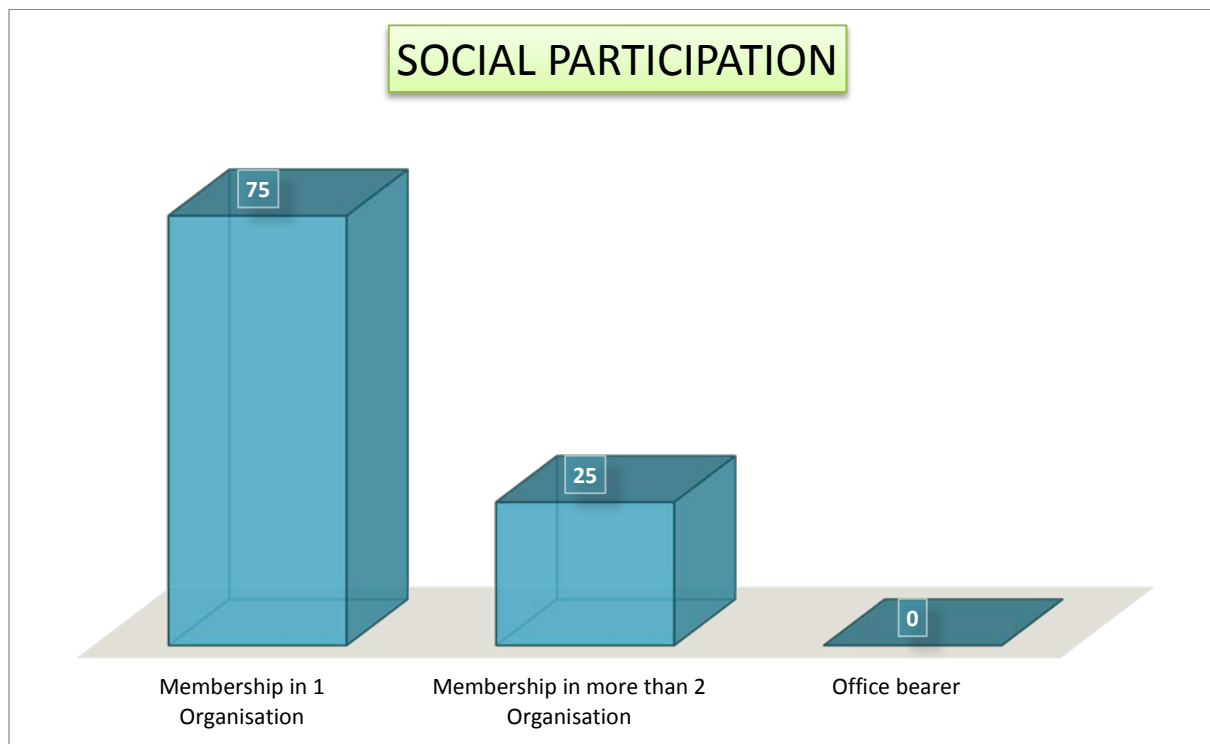


Figure-6.1.12 Distribution of beneficiaries on the basis of Material possession

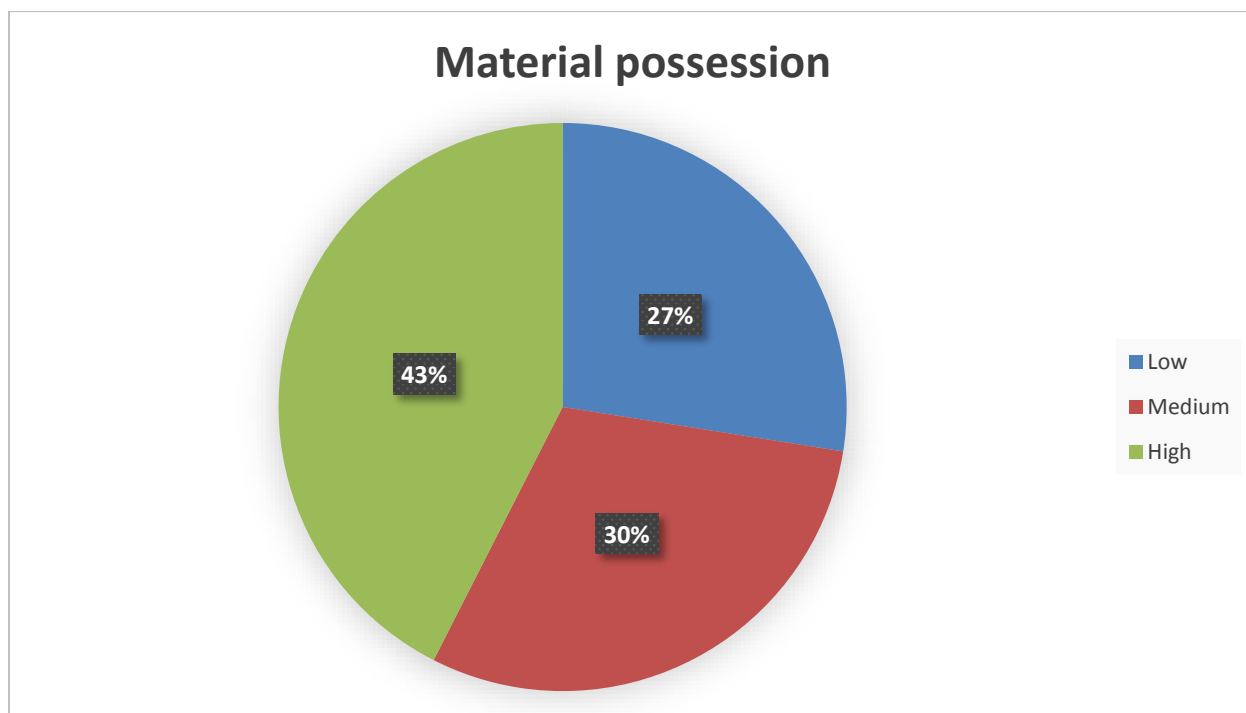


Figure-6.1. 13 Distribution of livestock of the respondents:



Figure-6.2.1 (knowledge of beneficiaries towards objectives and activities of NHM):

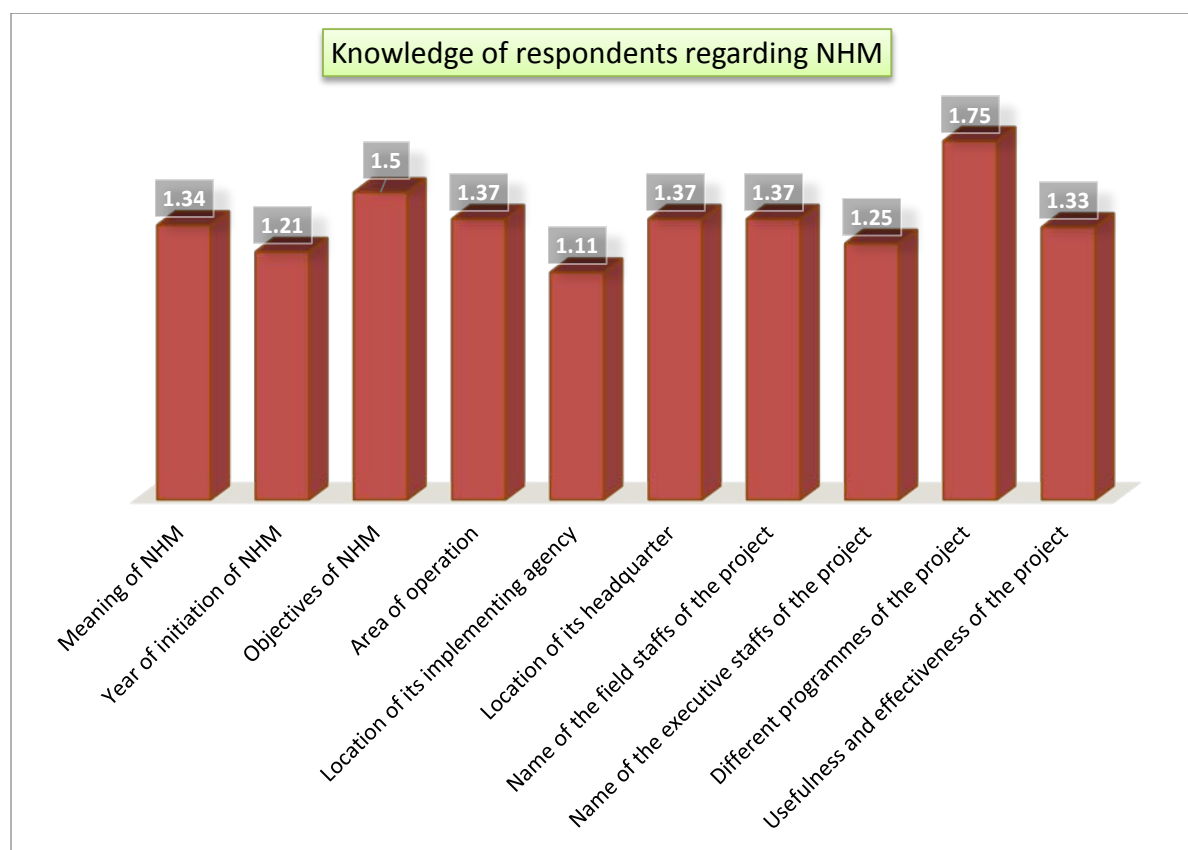


Figure- 6.2.2 (purpose of involvement of beneficiaries in NHM):

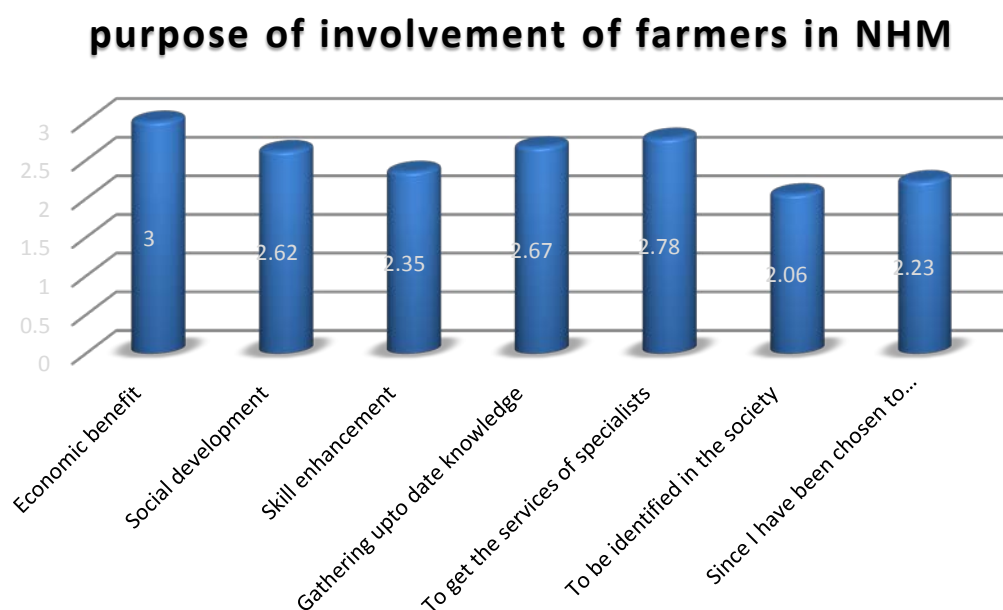


Figure-6.3.2(comparative study of average annual income):

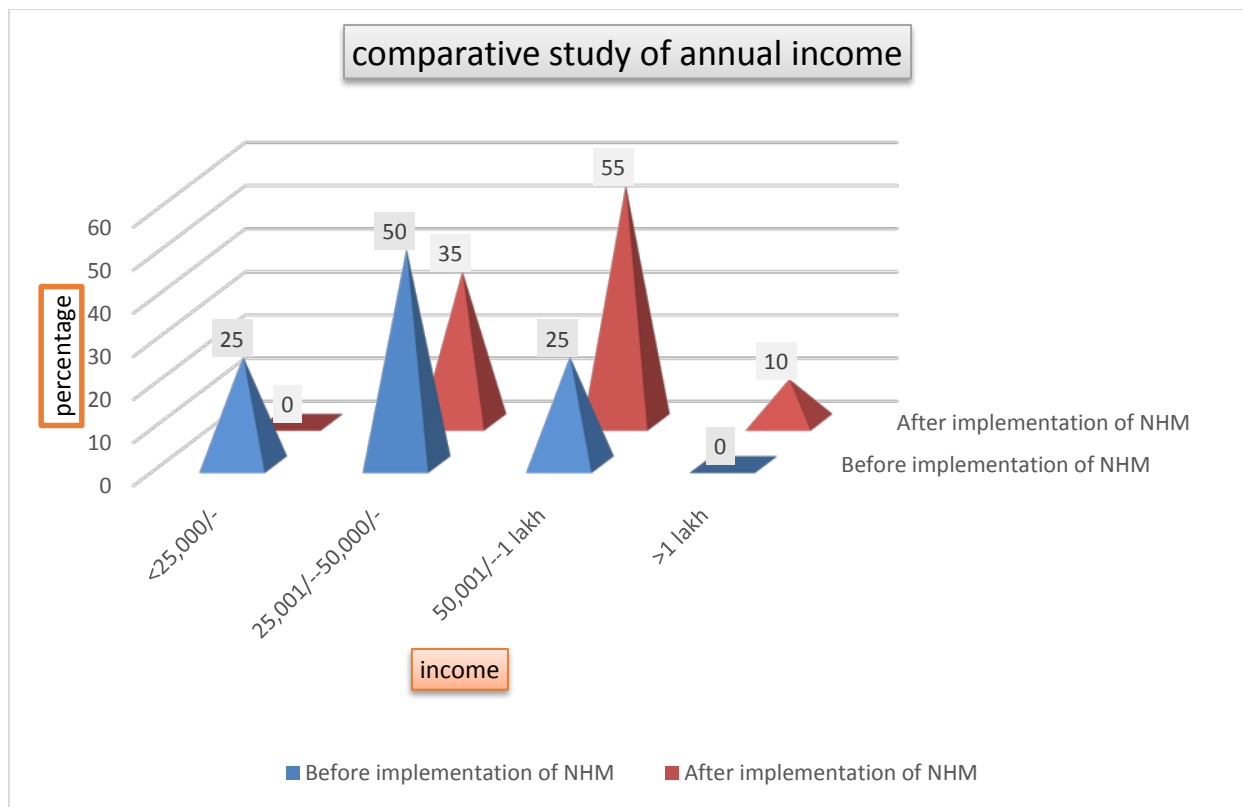


Figure-6.3.3(reasons for increased income):

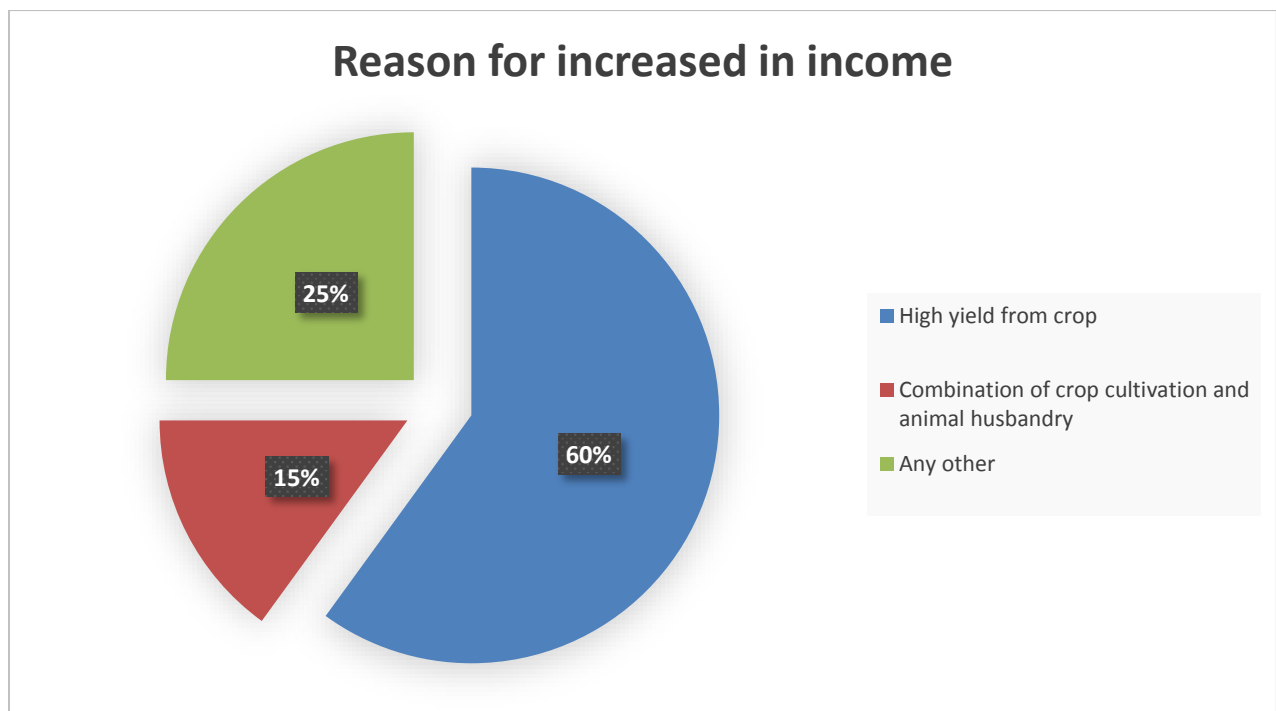


Figure-6.3.4 (improvement in socio-economic condition):

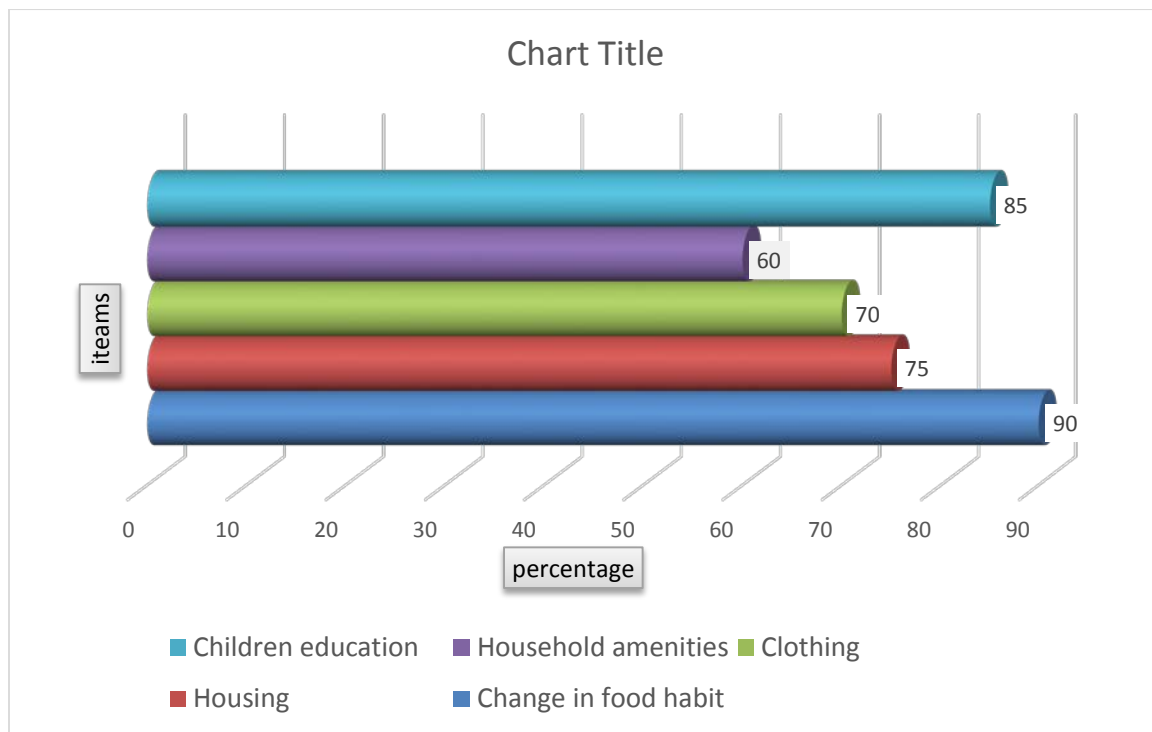


Figure-6.3.5(types of residence):



Figure-6.3.6 (Material possession):

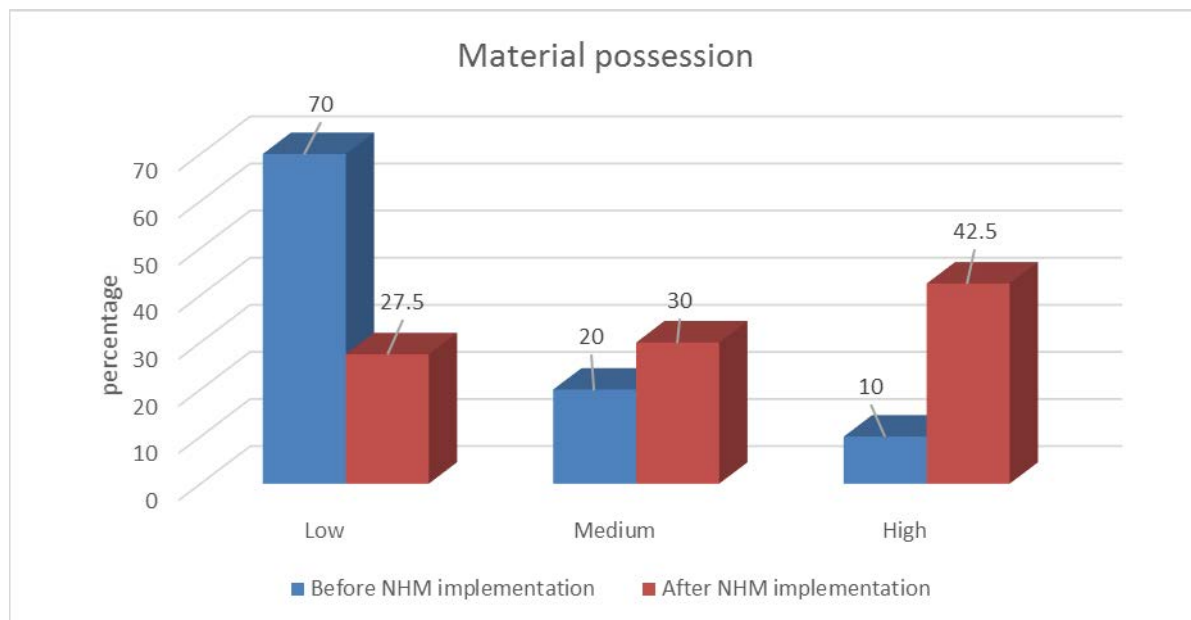


Figure-6.3.7 (livestock possession):

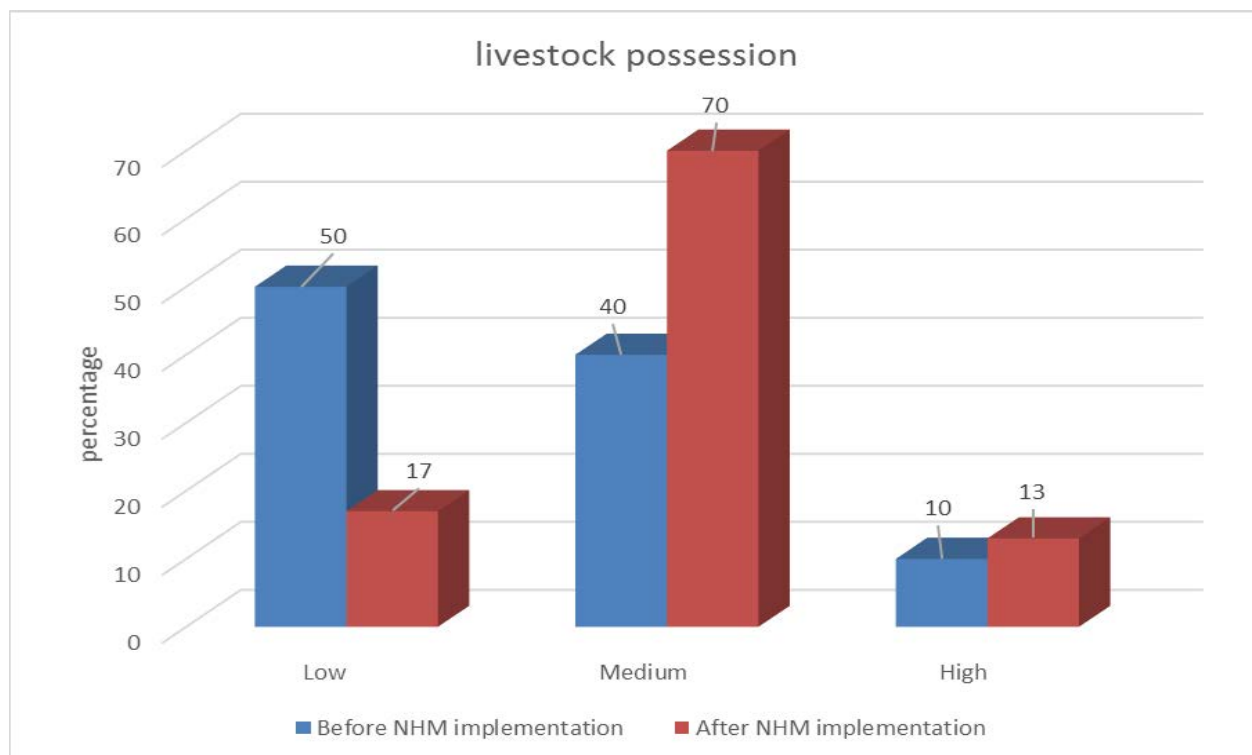


Figure-6.3.8(savings by the beneficiaries):

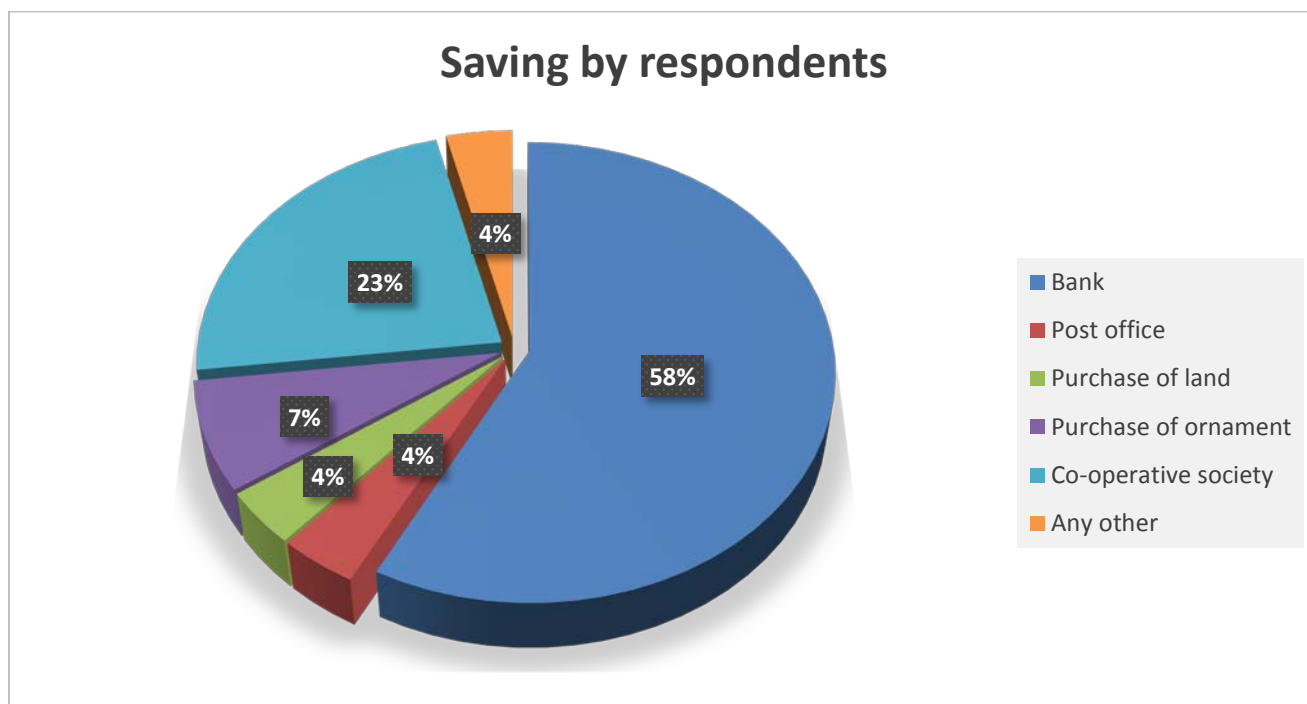


Figure-6.3.9(Technological development of the beneficiaries):

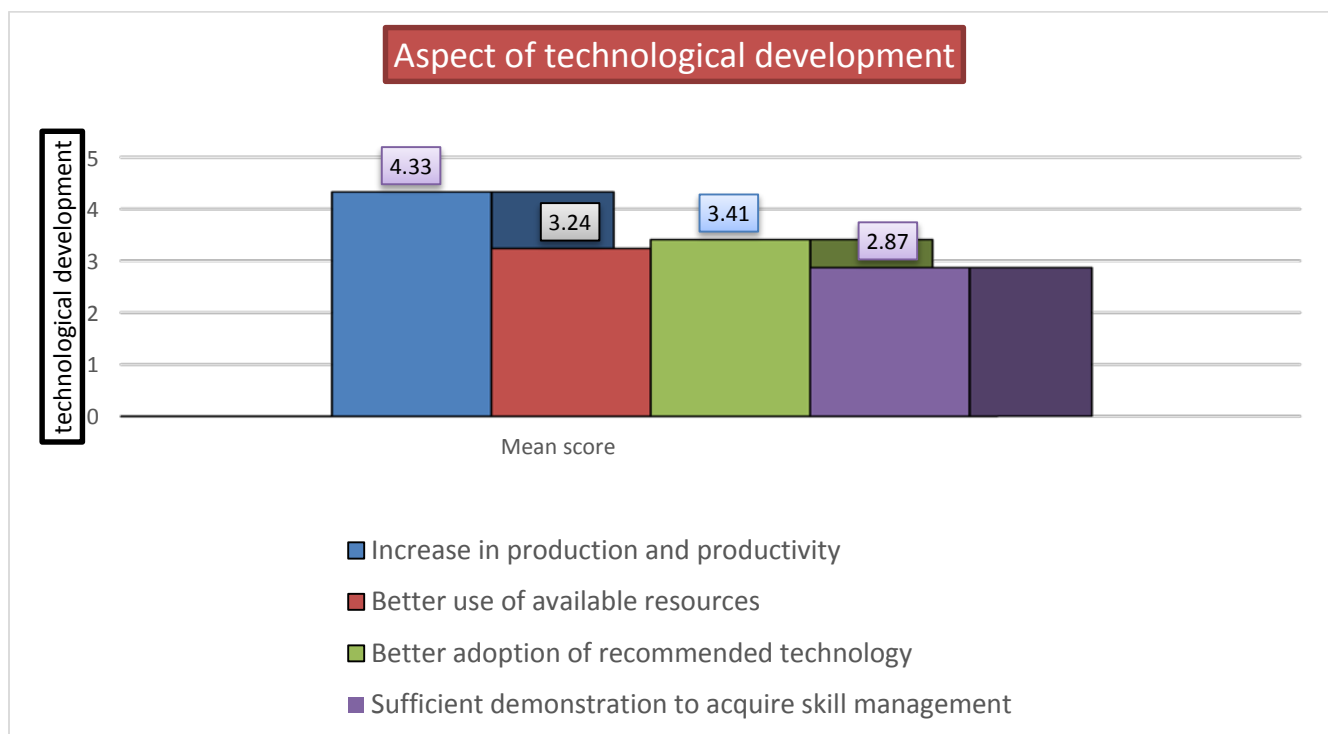


Figure-6.3.10(economic development of the beneficiaries):

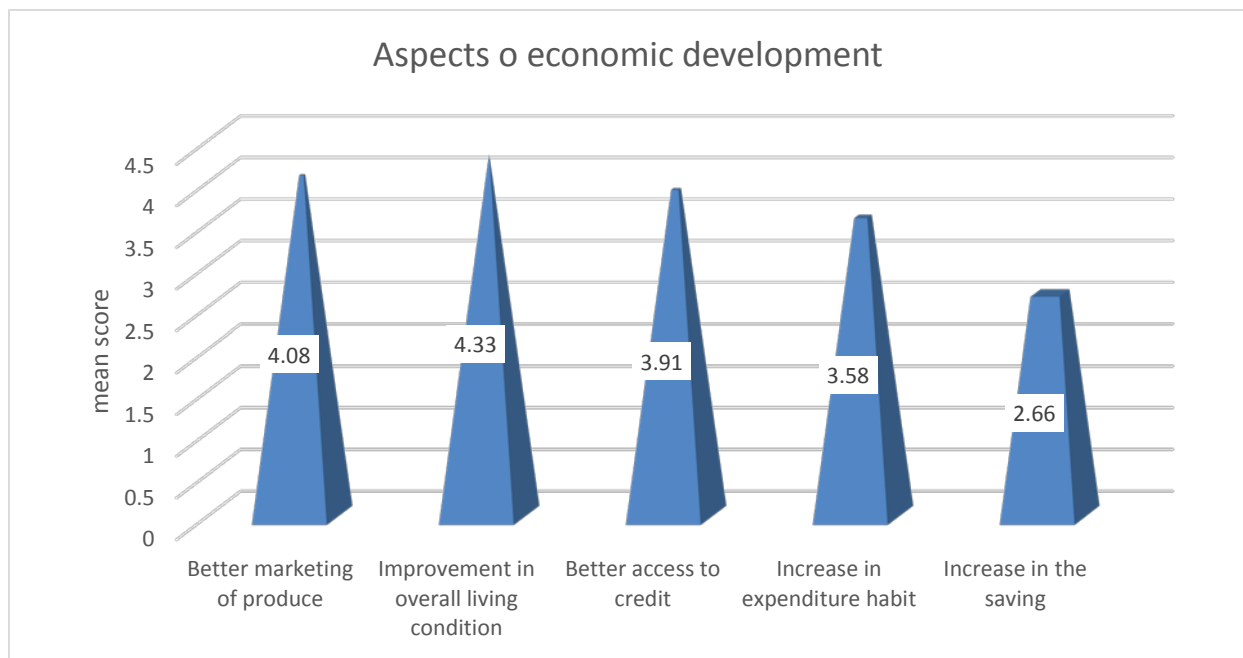


Figure- 6.3.11(social development of the beneficiaries):

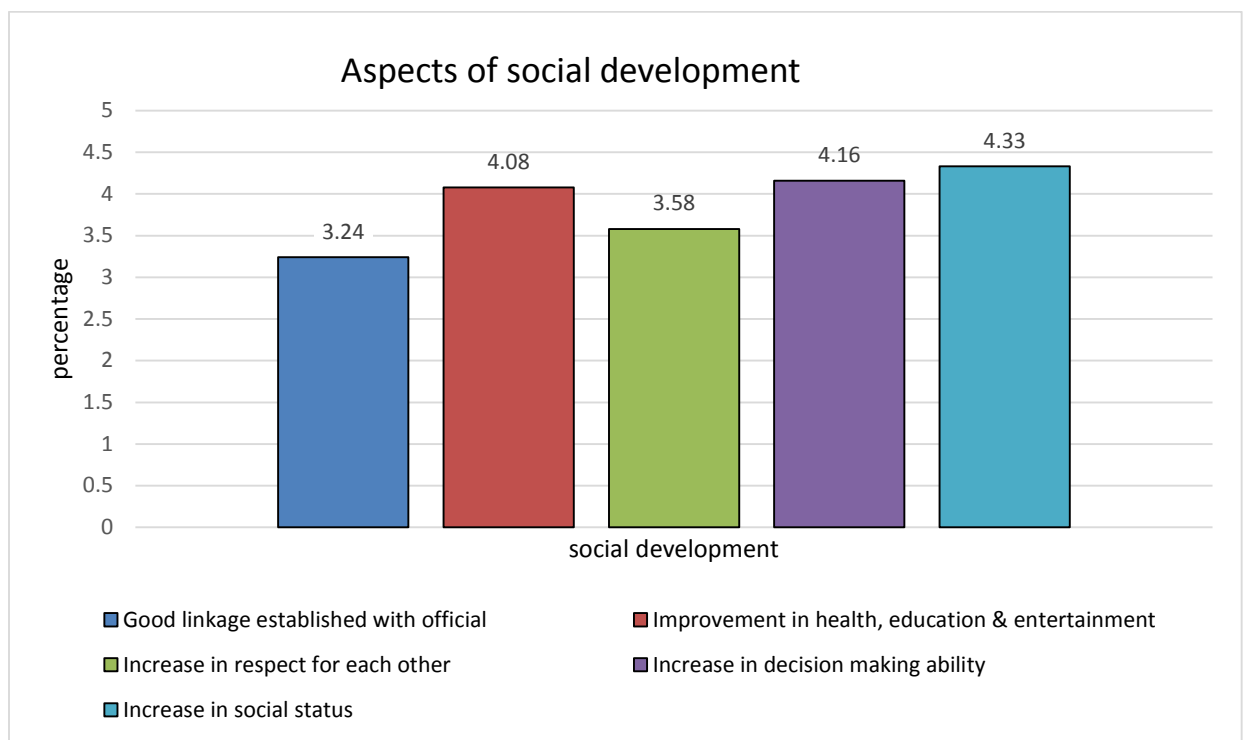


Figure-6.3.12(Environmental factors affects development of the beneficiaries):

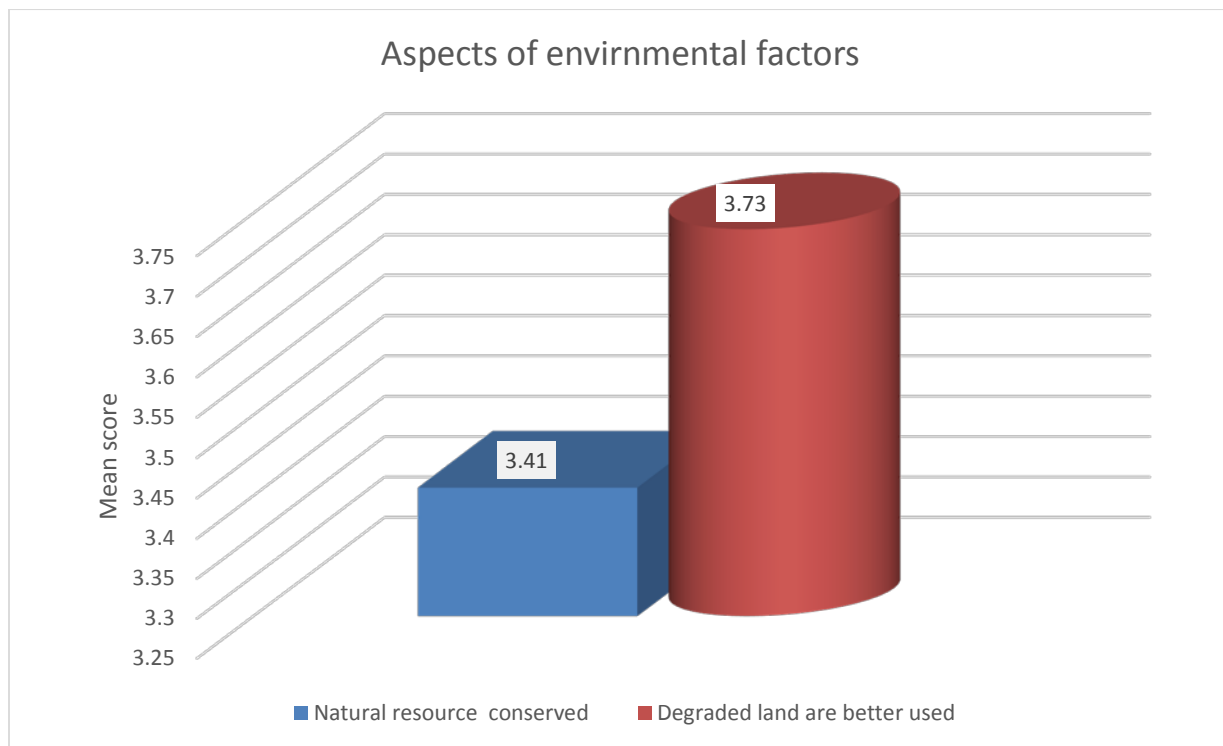


Figure- 6.3.13(cultural Developments of the beneficiaries):

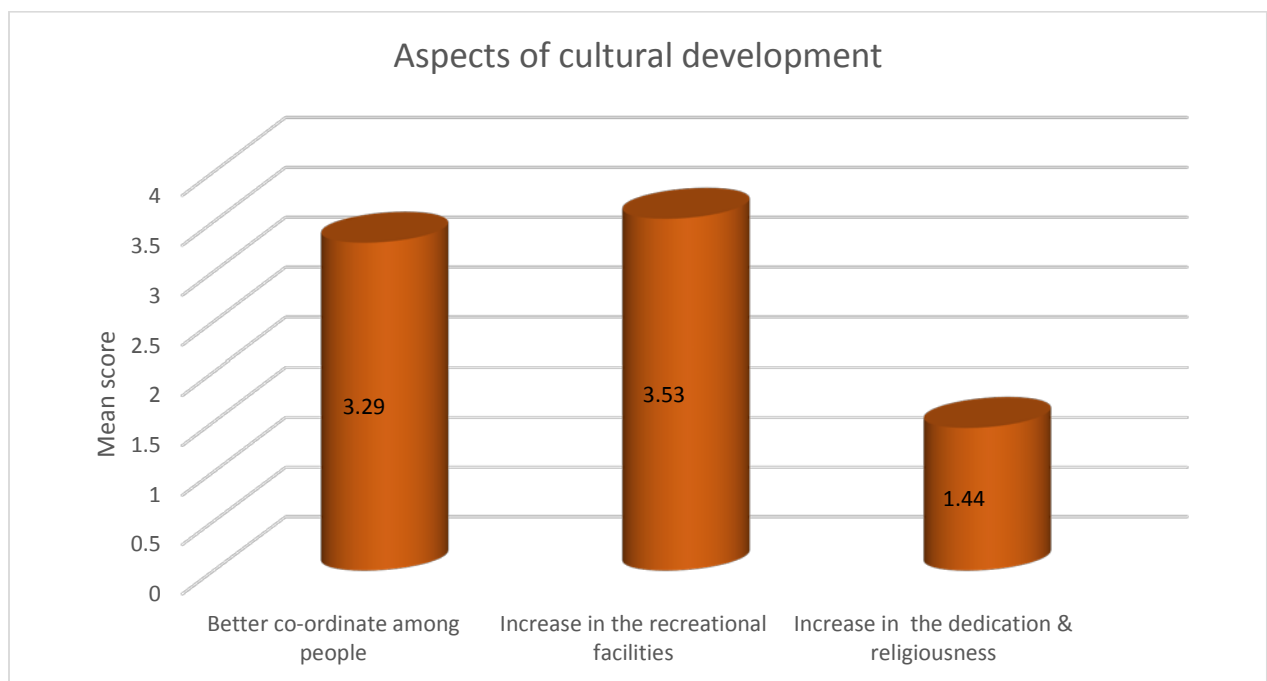


Figure-6.3.14(Developments of Aspiration of the beneficiaries):

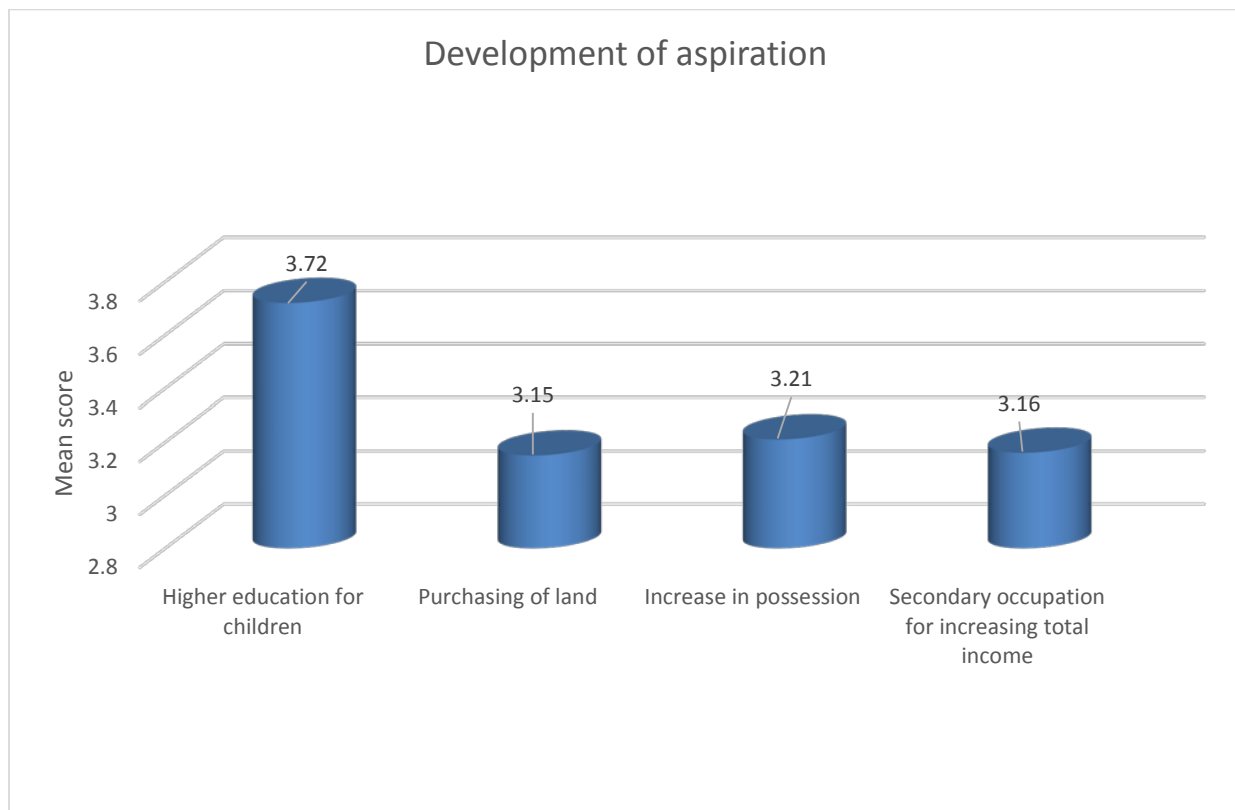


Figure-6.4.1 (Organization Constraints faced by Farmers):

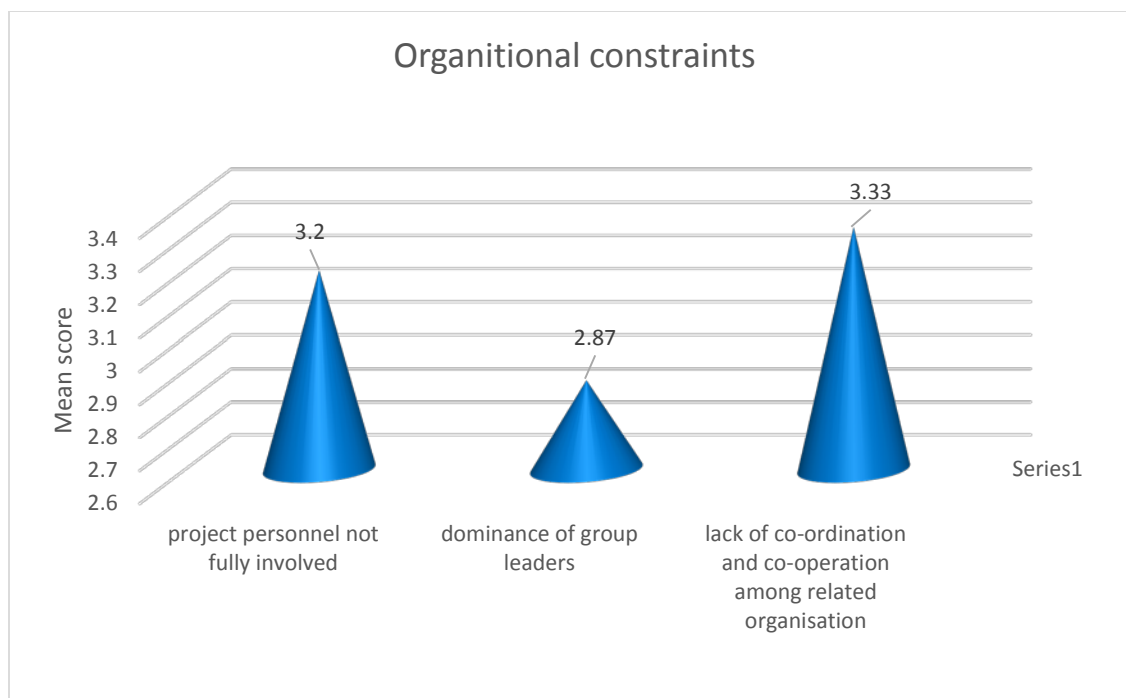


Figure-6.4.2(constraints in planning faced by farmers):

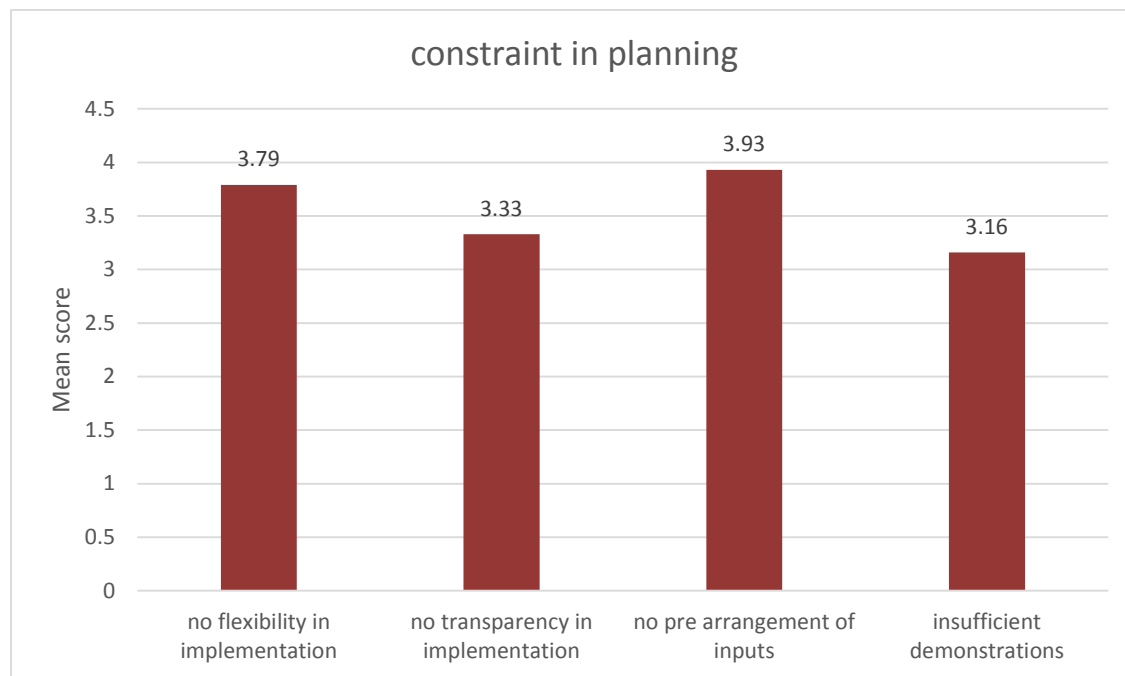


Figure- 6.4.3(constraints in programme implementation):

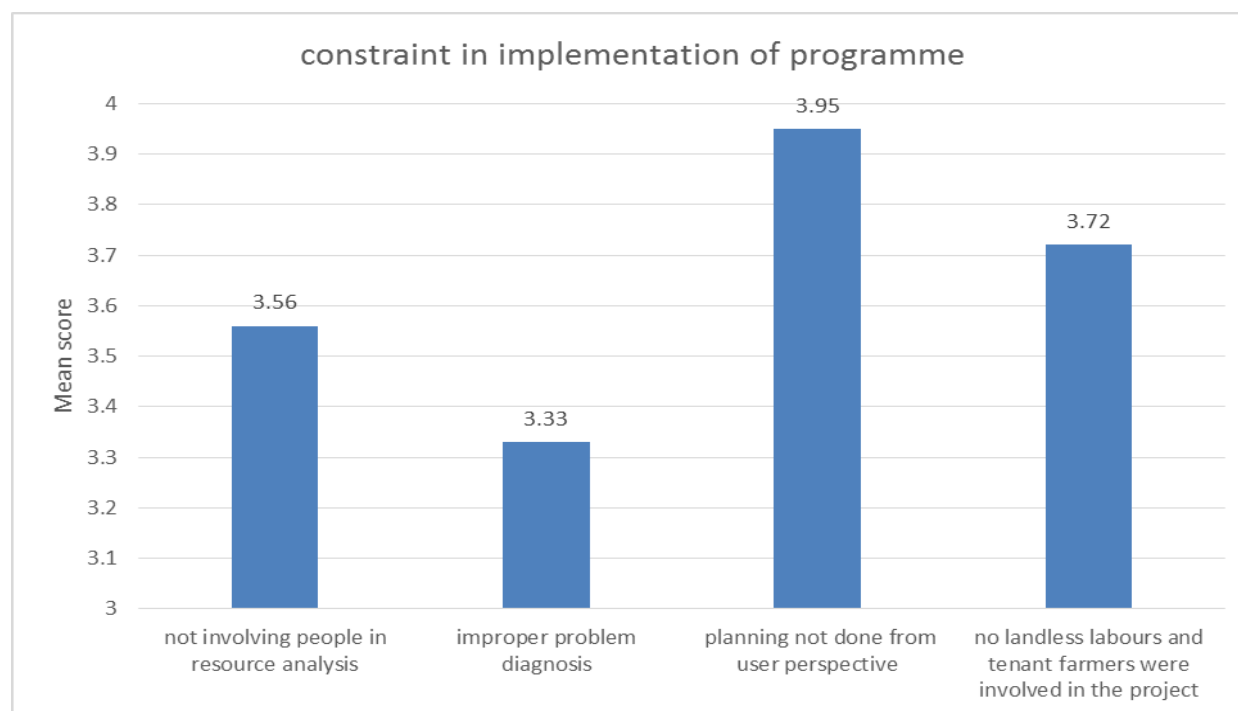


Figure-6.4.4(Constrains in funding faced by the beneficiaries):

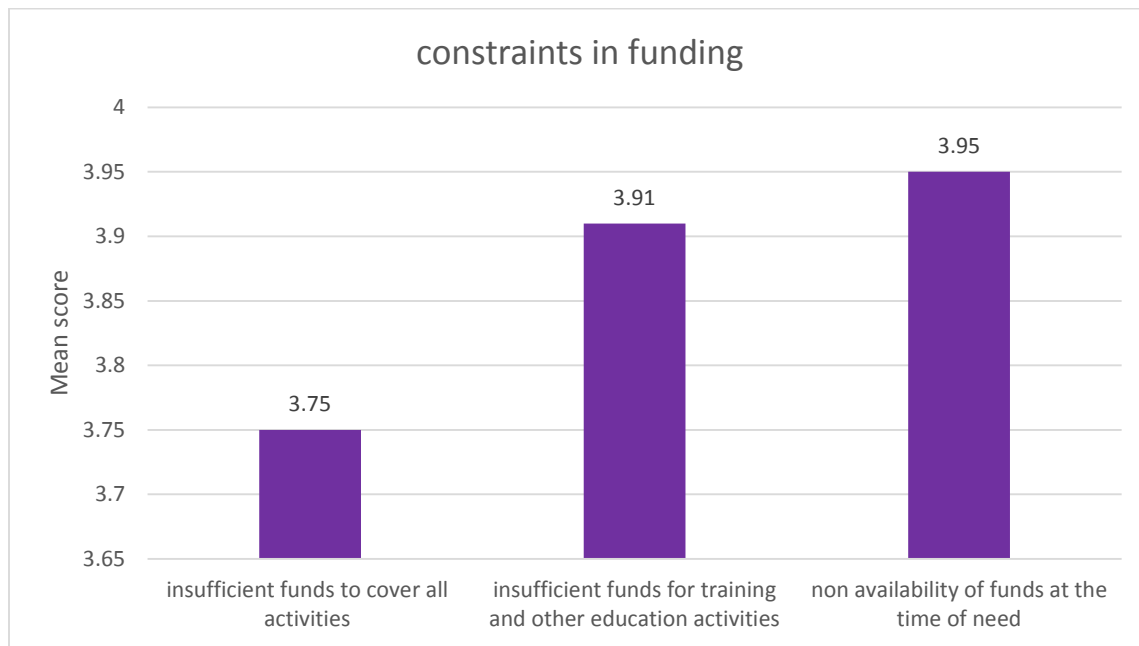


Figure-6.4.5(Technological Constrains faced by farmers):

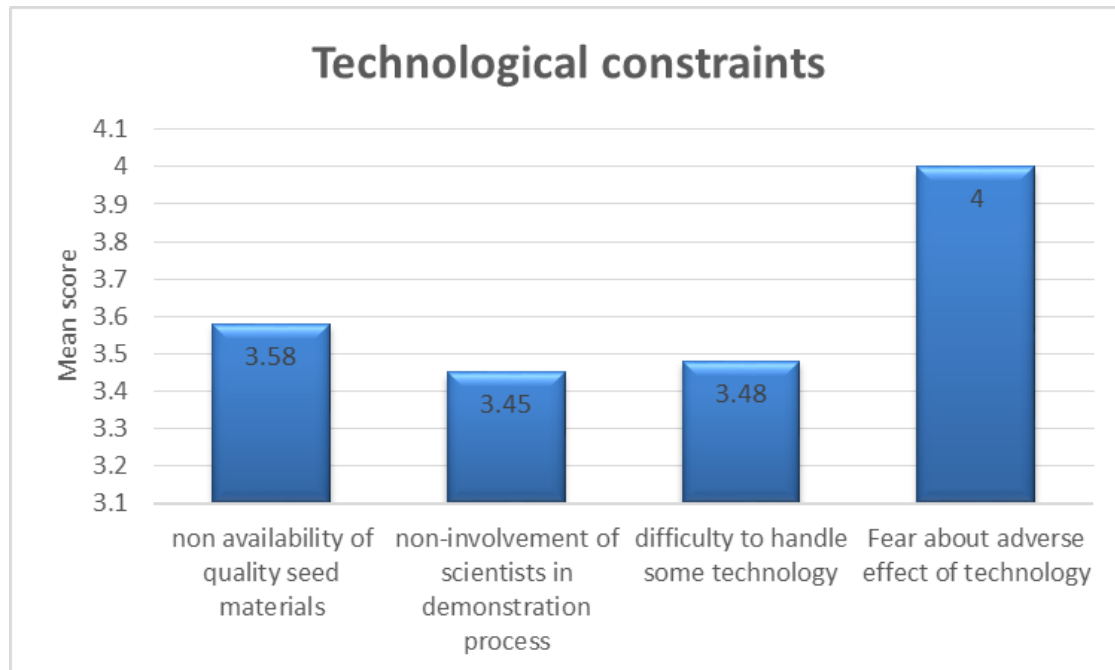
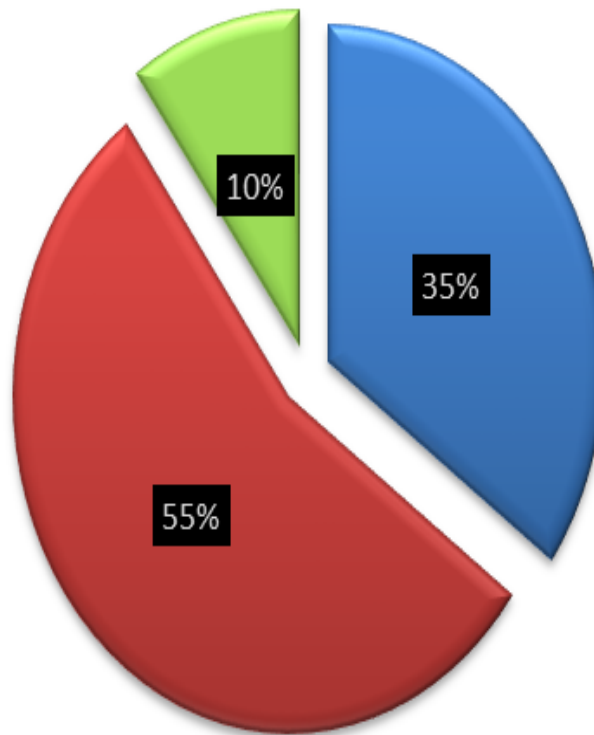


Figure 6.1.1 (age distribution of the respondents):

Age of the respondent



■ Young(upto 30 years) ■ Middle aged(31-50 years) ■ Old(above 50 years)

Figure-6.1.8(Distribution of average annual family income):

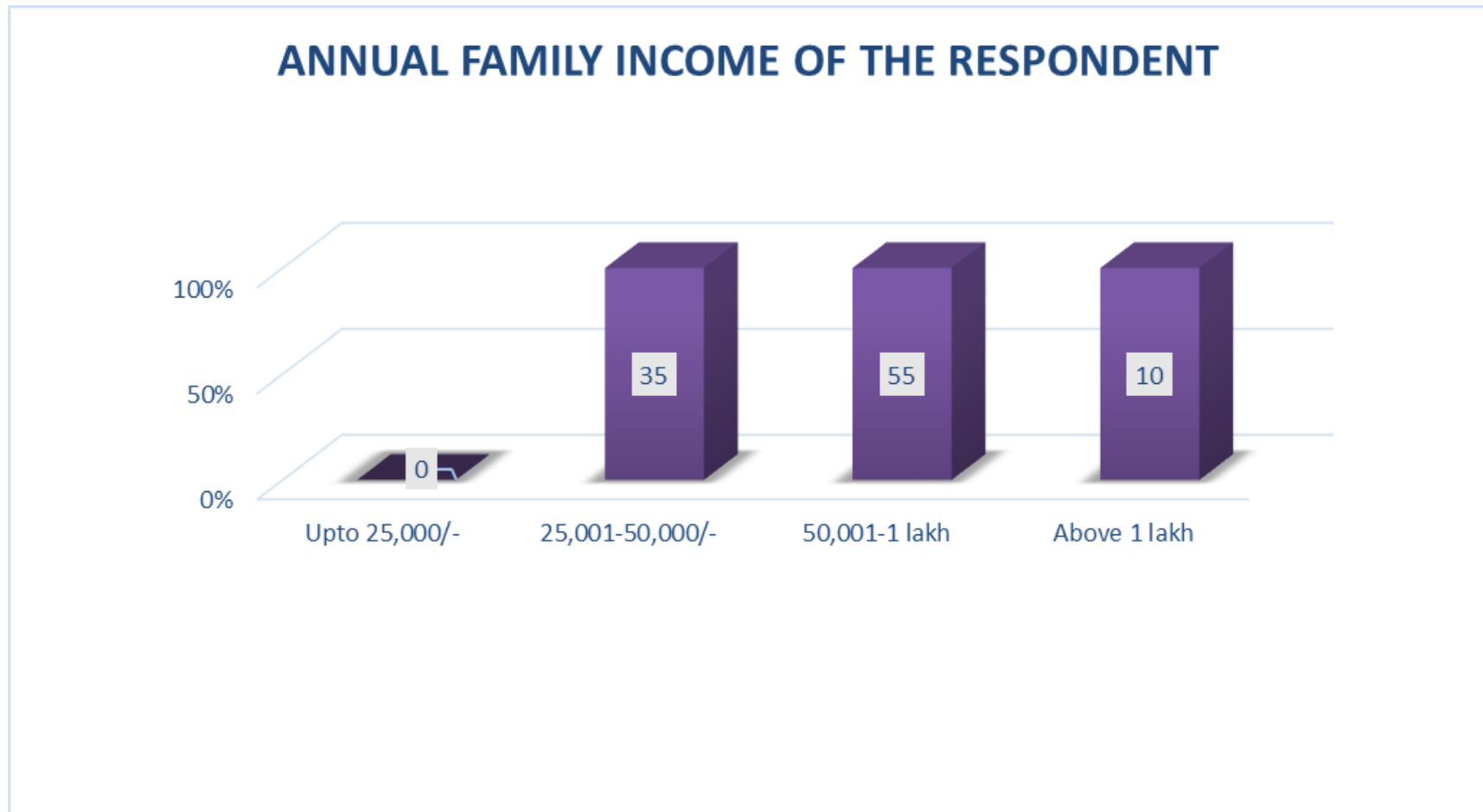


Figure-6.1.11(Extension contact of the respondents)

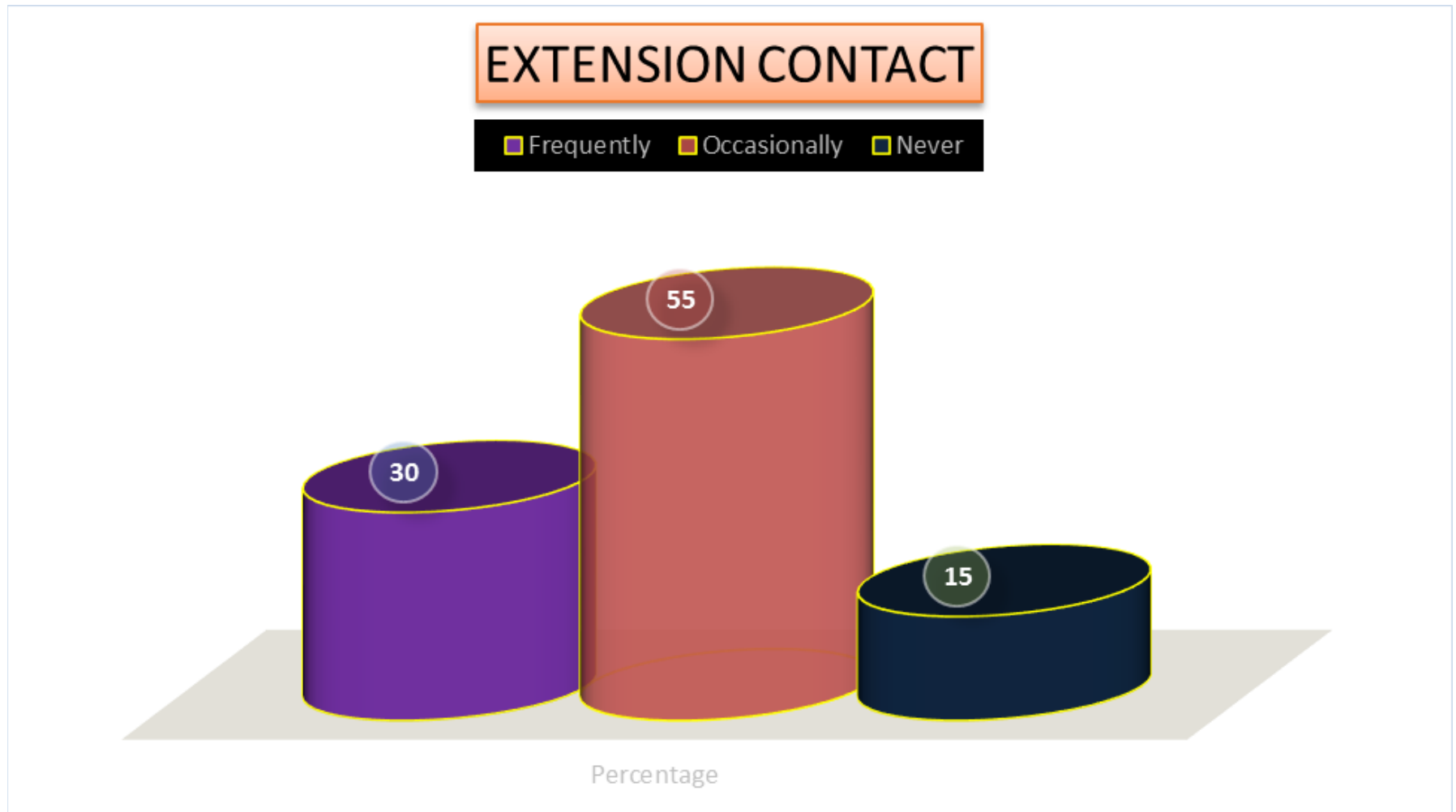


Figure-6.2.3(perception of beneficiaries towards NHM):

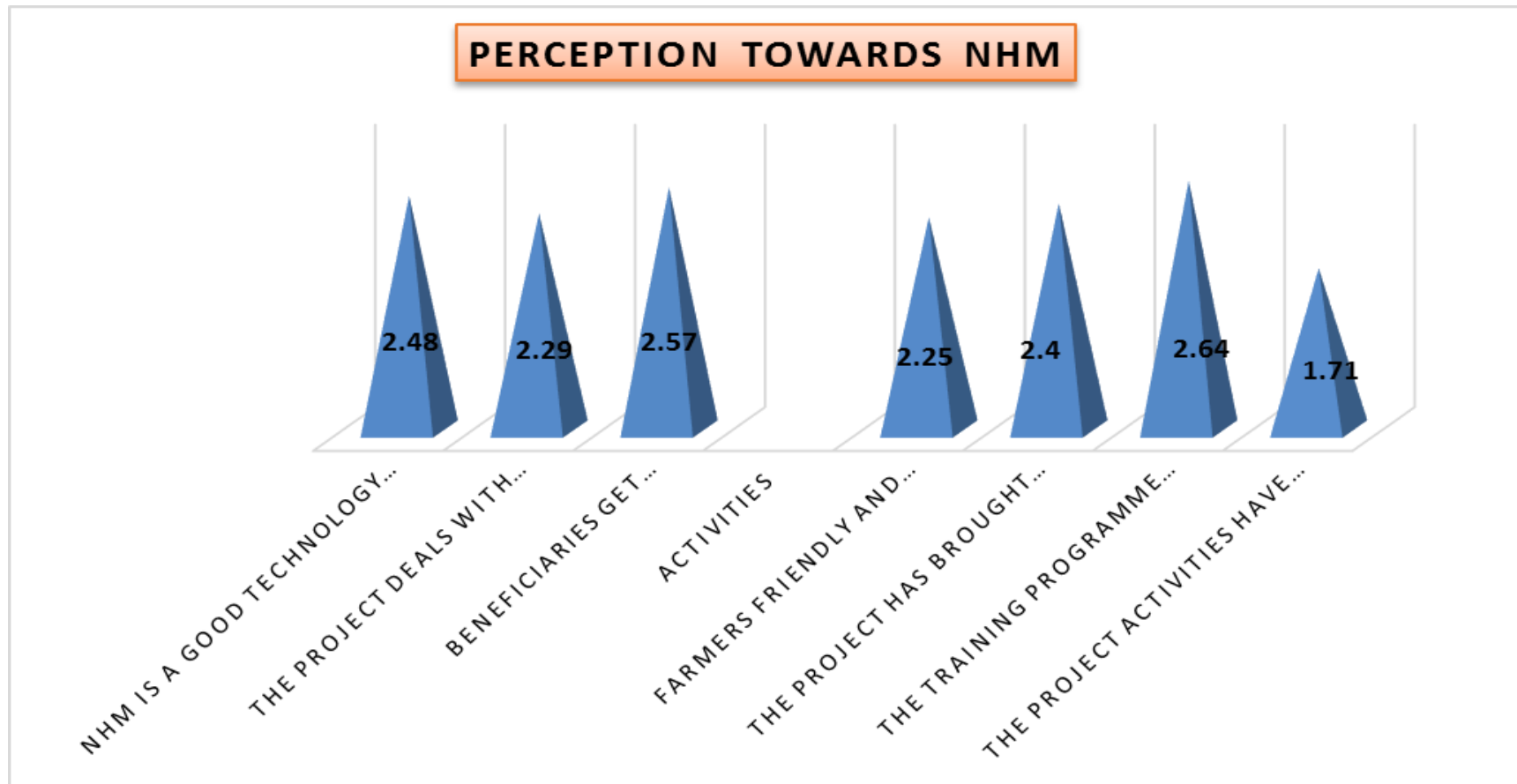


Figure- 6.2.13 Development of skill of the respondents:-

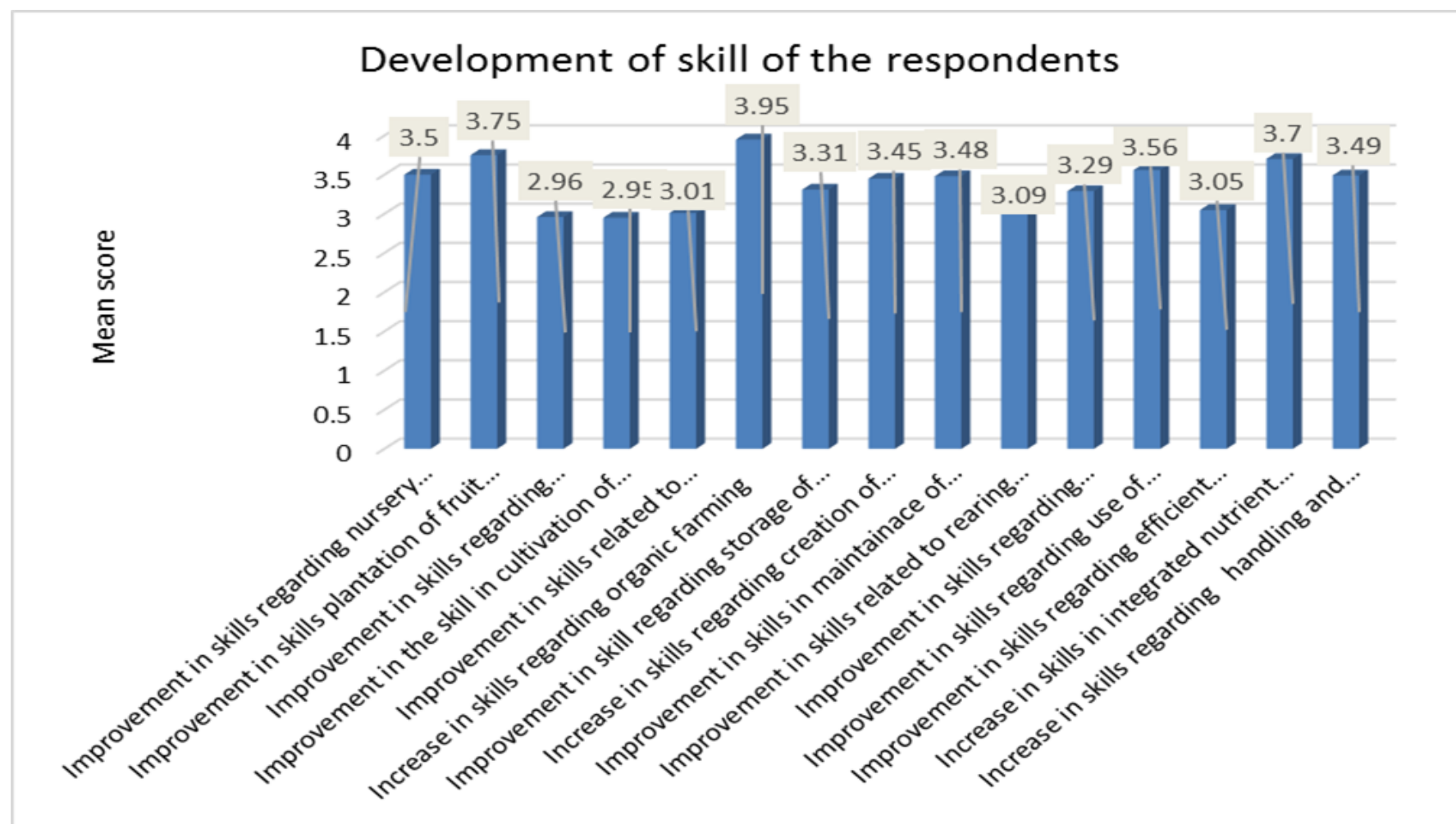


Figure- 6.4.6(Constrains in monitoring and evaluation faced by farmers):

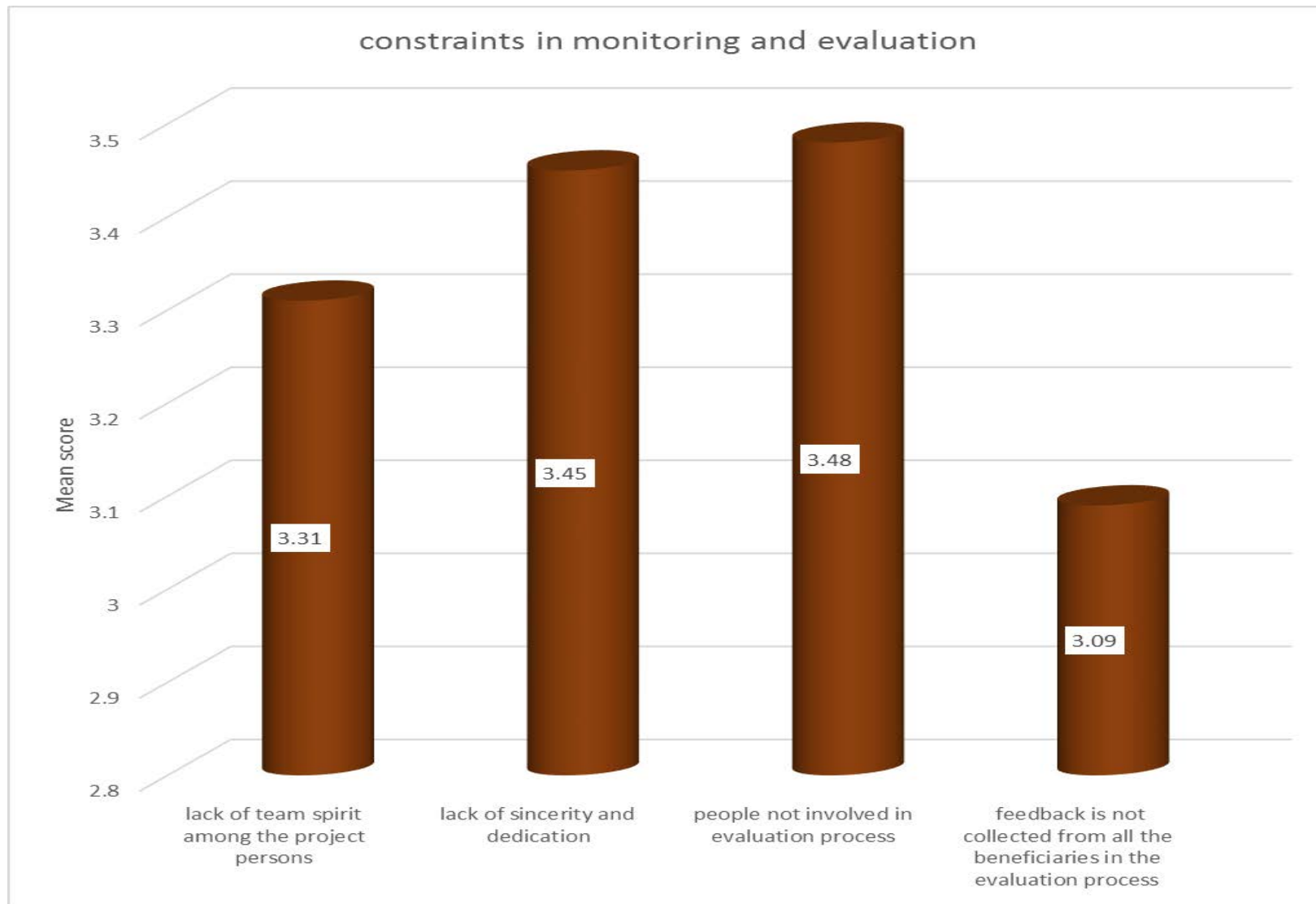
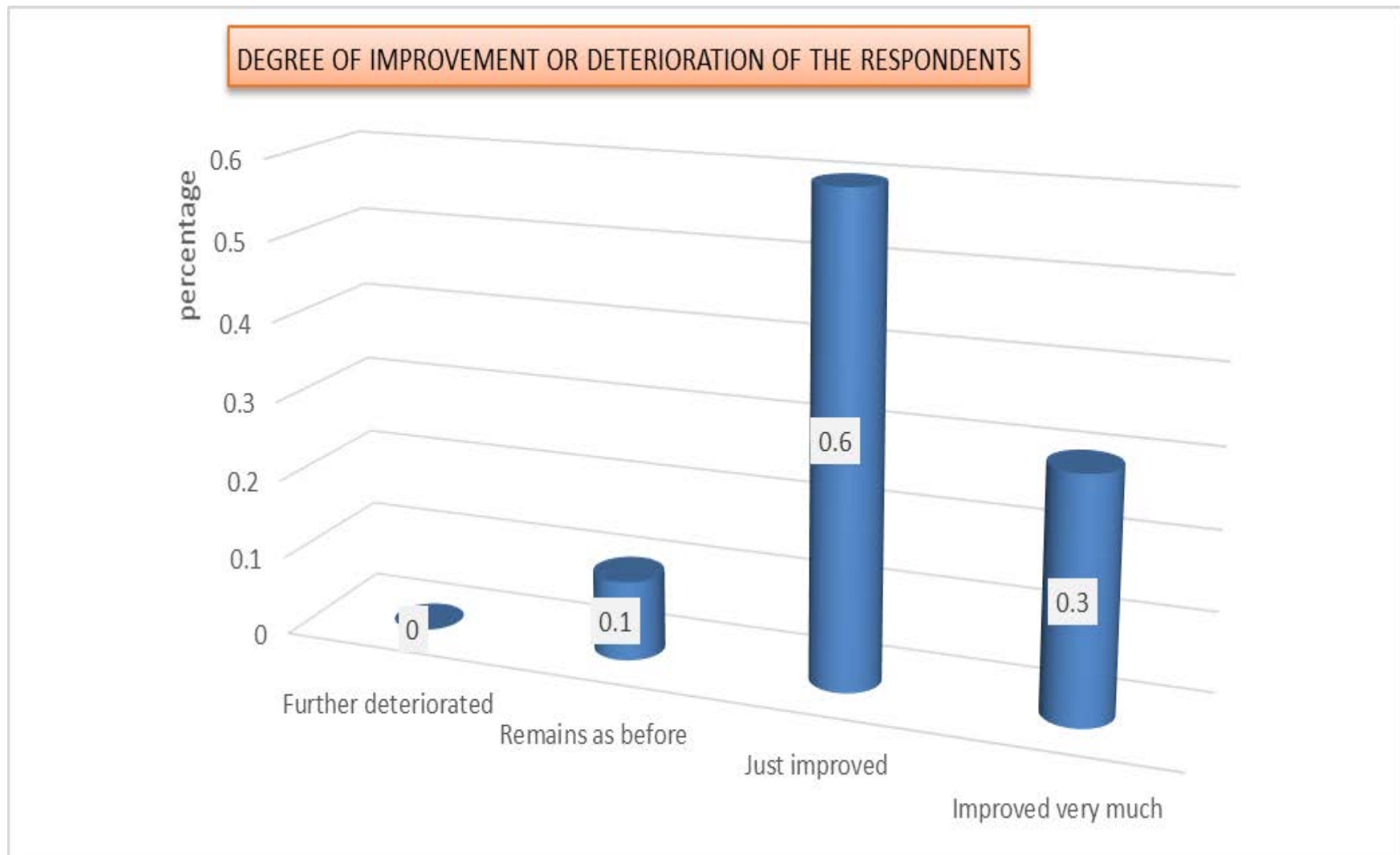


figure-6.3.1(Degree of improvement or deterioration of the respondents):









Mango cultivation



Vermicomposting



Gladiolus cultivation



Banana plantation